THE IMPACT OF ORGANISATIONAL CULTURE ON INNOVATION AND KNOWLEDGE SHARING AT THE GREAT ZIMBABWE UNIVERSITY

William Makumbe

Thesis submitted in accordance with the academic requirements for the degree

Doctor of Human Resource Management

in the

Faculty of Management Sciences

Department of Business Management

Central University of Technology, Free State

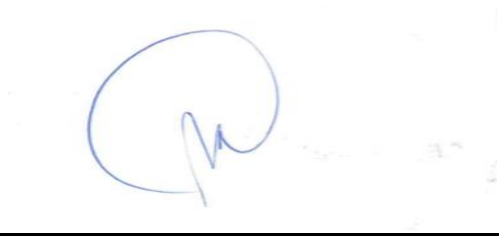
Promoter: Prof D Kokt (D Tech Human Resource Management)

Bloemfontein

January 2020

DECLARATION OF INDEPENDENT WORK

I, **William Makumbe**, passport number and student number , hereby declare that this research project submitted to the Central University of Technology, Free State, for the degree DOCTOR OF HUMAN RESOURCE MANAGEMENT, is my own independent work and complies with the Code of Academic Integrity, as well as with other relevant policies, procedures, rules and regulations of the Central University of Technology, Free State; and has not been submitted before to any institution by myself or any other person in fulfilment (or partial fulfilment) of the requirements for the attainment of any qualification.



SIGNATURE OF STUDENT

3 January 2020

DATE

ACKNOWLEDGEMENTS

Thank you to the Almighty God for giving me the spiritual strength throughout my intellectual journey.

I have been educated and inspired by people who have contributed in various ways to the production of this thesis. It would have been impossible to complete this study without their help. I am very grateful for the professionalism and support of the following people: In particular, I am greatly indebted to my promoter, Prof D Kokt, who offered me her valuable time, study material, vast knowledge and prompt responses. I benefited greatly from your wisdom. Professor, you enriched me beyond my imagination. I am also immensely grateful to Mrs Marisa Venter who assisted with the statistical analysis of my data.

My profound gratitude also goes to the Central University of Technology, Free State, for offering me an opportunity to pursue my doctoral journey and the research funding to complete my study. Lastly, my wife, Rugare, who has been a pillar for the past three years, together with my two sons, Tamu and Taro. Your understanding is greatly appreciated.

May God bless you all.

Summary

Because of globalisation, a highly complex and unpredictable world of work has emerged, characterised by accelerated digitalisation and intense competition. Organisations cannot afford to operate according to old paradigms; instead, flexibility and organisational change have to take centre stage. The critical ingredients of organisational change are continuous innovation and knowledge sharing. These two variables are enhanced by a conducive organisational culture.

Continuous innovation and knowledge sharing have become the linchpin of contemporary organisations, especially universities. Universities are considered to be reservoirs of knowledge where new and existing knowledge should be shared, bringing about continuous innovation for the benefit of society. Universities thus need to create a conducive environment to enable innovation and knowledge sharing.

Although numerous studies have focused on the relationship between organisational culture and variables such as innovation and knowledge sharing, universities have largely been excluded from such research. For this reason, the current study investigated the impact of organisational culture on innovation and knowledge sharing at Great Zimbabwe University (GZU). In the Zimbabwean context, policymakers now expect universities to lead the industrialisation and modernisation agenda.

A structured questionnaire was administered via the SurveyMonkey platform to a sample of 277 GZU staff members. A total of 195 questionnaires were collected for data analysis, yielding a response rate of 70.39%. The survey included a biographical section followed by sections on organisational culture (based on the Competing Values Framework), innovation (based on Dobni, 2008) and knowledge sharing (based on Jolaee, Md Nor, Khani, & Md Yusoff, 2014). Data were interpreted using descriptive statistics and partial least squares structural equation modelling (PLS-SEM) to analyse the relationships between the variables.

The results indicated that the university under investigation had a dominant rational/clan cultural orientation. Furthermore, a significant relationship was found between organisational culture and innovation and organisational culture and knowledge sharing.

No significant relationship was found between innovation and knowledge sharing. The findings confirmed that the culture profile of the university is imperative for innovation and knowledge sharing to be facilitated. The study proposes that innovation and knowledge sharing can best be realised through the prevalence of the adhocracy culture type. A strategic framework is proposed to the management of GZU to enhance the pervasiveness of these variables. Areas of further research and the limitations of the study are also set out.

Key words: Organisational culture, innovation, knowledge sharing, globalisation, university, new managerialism, collegiality, Great Zimbabwe University, Competing Values Framework, SurveyMonkey.

Table of Contents

Page

Declaration of independent work ..... **i**
Acknowledgements ..... **ii**
Summary ..... **iii**
List of figures ..... **viii**
List of tables ..... **viii**
Glossary ..... **x**
CHAPTER 1: INTRODUCTION **1**
1.1 Background to the study **1**
1.2 Previous research **2**
1.3 Problem statement **4**
1.4 Main research question **5**
1.4.1 Research sub questions **5**
1.5 Main research objective **6**
1.5.1 Sub objectives **6**
1.6 Research philosophy/paradigm **6**
1.7 Research approach and design **7**
1.8 Ethical considerations **8**
1.9 Limitations of the study **9**
1.10 Significance and value of the study **9**
1.11 Chapter overview **9**
1.12 Summary **10**
CHAPTER 2: CONCEPTUALISING ORGANISATIONAL CULTURE **11**
2.1 Introduction **11**
2.2 Explaining organisational culture **12**
2.3 Levels of organisational culture **14**
2.4 The determinants of organisational culture **15**
2.5 Characteristics of organisational culture **17**
2.6 Strong and weak organisational cultures **19**
2.7 Sustaining organisational culture **21**
2.8 Culture as a liability **22**
2.9 National and industry cultures **23**
2.9.1 National culture **23**
2.9.2 Industry culture **25**
2.10 Organisational culture and organisational climate **27**
2.10.1 Perceptions on organisational climate **28**
2.11 Contemporary issues in organisational culture **30**
2.11.1 Creating an innovative organisational culture **30**
2.11.2 Creating a customer-focused organisational culture **32**
2.11.3 Workplace spirituality and organisational culture **34**
2.12 Theoretical framework **36**
2.13 Summary **41**
CHAPTER 3: INNOVATION AND KNOWLEDGE SHARING IN A UNIVERSITY CONTEXT **43**
3.1 Introduction **43**
3.2 Explaining innovation **44**
3.3 Theoretical perspectives on innovation **45**
3.3 1 Dynamic Capabilities Approach **45**
3.3.2 Dynamic capabilities and innovation **47**

3.4 Types of innovation 48
3.5 Drivers of innovation 50
3.6 The role of universities in fostering innovation 54
3.7 Innovation in developing countries 56
3.8 Knowledge sharing 58
3.8.1 Theoretical perspectives of knowledge sharing 59
3.8.2.1 Theory of planned behaviour 60
3.8.2.2 Theory of self-efficacy 62
3.8.3 Knowledge-sharing drivers in universities 63
3.8.3.1 Personal factors 64
3.8.3.2 Organisational factors 65
3.9 Organisational culture and innovation 67
3.10 Organisational culture and knowledge sharing 68
3.11 Conceptual framework for the study 69
3.12 Summary 70
CHAPTER 4: THE EVOLUTION OF UNIVERSITIES WITH SPECIAL REFERENCE TO GREAT ZIMBABWE UNIVERSITY 71
4.1 Introduction 71
4.2 Evolution of universities from collegiality to managerialism 71
4.3 The changing role of universities 74
4.4 Universities in the Zimbabwean context 76
4.5 Current research and innovation practices in Zimbabwe 78
4.5.1 The development of research and innovation policy in Zimbabwe 79
4.5.2 Challenges facing Zimbabwean universities 80
4.5.3 Opportunities for Zimbabwean universities 85
4.6 Profiling Great Zimbabwe University 86
4.7 Summary 90
CHAPTER 5: RESEARCH METHODOLOGY 92
5.1 Introduction 92
5.2 Research philosophy/paradigm 93
5.3 Research approach and design 93
5.4 Population 95
5.5 Sampling 95
5.8 Data collection 98
5.10 Data analysis 98
5.11 Summary 98
CHAPTER 6: DISCUSSION AND ANALYSIS OF FINDINGS 100
6.1 Introduction 100
6.2 Descriptive statistics 100
6.2.1 Demographic profile of respondents 100
6.2.2 Organisational culture at GZU 104
6.2.2.1 Research objective 1: The prevailing organisational culture at GZU 104
6.2.2.2 Research objective 2: Levels of innovation at GZU 107
6.2.2.3 Research objective 3: Levels of knowledge sharing at GZU 111
6.3 Structural equation modelling (research objectives 4, 5 and 6) 115
6.3.1 Assessing the outer model 117
6.3.2 Assessing the inner (structural) model 126
6.4 Summary 134
CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS 135
7.1 Introduction 135

7.2 Conclusions **135**
7.2.1 The dominant culture of GZU **135**
7.2.2 Levels of innovation at GZU **137**
7.2.3 Level of knowledge sharing at GZU **137**
7.2.4 Organisational culture and innovation **138**
7.2.5 Organisational culture and knowledge sharing **138**
7.2.6 Knowledge sharing and innovation **139**
7.3 Contribution **140**
7.4 Limitations **141**
7.5 Recommendations (research objective 7) **142**
7.6 Further research **144**

LIST OF REFERENCES **146**
Appendix A – Questionnaire **176**

LIST OF FIGURES

Figure 2.1 The levels of culture 14
Figure 2.2 How organisation culture form 21
Figure 2.3: The Competing Values Framework 37
Figure 2.4 The Competing Values Framework for Leadership, effectiveness and Value drivers 40
Figure 3.1 A framework of factors that influence innovation 53
Figure 3.2 Triple Helix Model: 54
Figure 3.3 A framework of factors that influence knowledge sharing 67
Figure 3.4 A research model for the link between organisation culture, innovation and knowledge sharing 69
Figure 6.1 Gender of Respondents 101
Figure 6.2 Respondents Work Section 101
Figure 6.3 Qualifications 102
Figure 6.4 Respondents Position at GZU 103
Figure 6.5 Respondents Work Experience 103
Figure 6.6 Research Model 118
Figure 6.7 Procedure for assessing PLS-SEM structural model 126
Figure 6.8. The PLS-SEM for Organisational Culture,Innovation and Knowledge Sharing at GZU 130
Figure 6.9. Organisational Culture Map 131
Figure 7.1 Framework for enhancing Innovation and Knowledge Sharing at GZU ... 142

LIST OF TABLES

Table 2.1 Strong versus weak organisational cultures 20
Table 2.2 Differences between organisational climate and organisational culture 28
Table 2.3 Major perceptions on organisation climate 29
Table 2.4 Characteristics of customer responsive cultures 34
Table 3.1 Global Innovation Index Ranking 57
Table 4.1 Public and private universities in Zimbabwe 77
Table 4.2 Mainstream scientific publications from top five African countries - 2012 ... 78
Table 4.3 Staff Statistics at GZU 87
Table 4.4 Academic Staff Summary at GZU 88
Table 4.5Student Enrolment by Gender 89
Table 4.6Distribution of mainstream scientific publications in Zimbabwean Universities(2002-2013) 90
Table 6.1 Clan(Group) Culture 104
Table 6 2 Adhocracy(Developmental)Culture 105
Table 6.3 Hierarchical Culture 106
Table 6.4 Rational Culture 107
Table 6.5 Employee Creativity and Empowerment 107
Table 6.6 Organisational Constituency 108
Table 6.7 Organisational Learning 109
Table 6.8 Innovation Propensity 109
Table 6.9 Implementation Context 110
Table 6.10 Subjective Norm 111
Table 6.11 Self-Efficacy 112
Table 6.12 Organisational Support 113
Table 6.13 Attitude Towards Knowledge Sharing 114

Table 6.14 Intention to Share Knowledge 114
Table 6.15 Indicators and abbreviations used in data analysis 115
Table 6.16 Shapiro-Wilk Test 116
Table 6.17 Measurement of First Order Variables 120
Table 6.18 Measurement Model: Second Order Latent Variables 121
Table 6.19 Cross Loadings 123
Table 6.20 Fornell-Lacker Criterion..... 124
Table 6.21 HTMT Ratios..... 125
Table 6.22 Collinearity Statistics..... 126
Table 6.23 Path Model Results of PLS-SEM 127
Table 6.24 R-Square..... 128
Table 6.25 Effect Size (f2) 129
Table 6.26 Predictive Relevance(Q2) 129

GLOSSARY

CVF	Competing Values Framework
GZU	Great Zimbabwe University
HTMT	Heterotrait–Monotrait ratio
ICT	Information Communication Technology
IMF	International Monetary Fund
PLS-SEM	Partial Least Squares Structural Equation Modelling
R&D	Research and Development
SARUA	Southern Africa Regional Universities Association
SETI	Science Engineering Technology and Innovation
STEM	Science Technology Engineering and Mathematics
TTOs	Technology Transfer Offices
UNESCO	United Nations Education, Scientific and Cultural Organisation
ZIMSTAT	Zimbabwe Statistics Agency

CHAPTER 1: INTRODUCTION

1.1 Background to the study

The world of work, work itself and the composition of the workforce are being reshaped by sweeping global changes. These changes can mostly be attributed to globalisation and the technological advancements associated with the Fourth Industrial Revolution (notably artificial intelligence, robotics, automated systems, etc.), all of which have created the so-called new world of work. According to McDowell, Agarwall, Miller, Okamoto and Page (2016), workforce diversity, increased usage of digital technologies, an accelerated rate of business innovation and flexible working arrangements now characterise the new world of work. It is clear that we are living in a time of revolution – a period of rapid change and disruption.

The new world of work is enabled by digital products and services driven by the Internet and various forms of Information Communication Technology (ICT) (Kokt, 2017). Furthermore, advances in technology have created a mobile workforce that is frequently connected to the workplace through smart phones and various forms of ICT like video conferencing (Buchanan, Kelley, & Hatch, 2016). This has, in many cases, impacted the operations and design of organisations, dismantling structural hierarchies and establishing agile team-based organisational structures (Deloitte, 2017).

Given this wave of digitalisation, which is rapidly altering economies around the world, innovation and knowledge sharing are now more important than ever (Cirera & Maloney, 2017). A conducive organisational culture can assist organisations in fostering a collaborative and innovative culture to enable their adaptation to a fast changing external environment (McDowell *et al.*, 2016).

Despite the potential benefits of innovation, developing countries are less innovative than developed countries (Cirera & Maloney, 2017). Most of the work on innovation has been done through a ‘developed country lens’ and, as such, innovation has largely been perceived as a ‘first world’ activity. Hence, little is known about innovation and knowledge-sharing activities in developing countries (Cirera & Maloney, 2017). An in-

depth understanding of innovation and knowledge sharing from a developing country perspective is therefore paramount.

Universities need to be at the forefront of navigating the challenges of the new world of work, including the complexity of the digital economy. To achieve this, they need to nurture and harness new knowledge, as well as train knowledge workers to be able to function in an increasingly complex, interconnected, unpredictable and evolving work environment. Thus, universities should be attuned to the challenges of the new economy – of which innovation and knowledge sharing are critical components. Furthermore, they need to instil the importance of innovation and knowledge sharing amongst staff and students (Fullwood, Rowley, & Delbridge, 2013). With this in mind, the current study focused on the impact that organisational culture is likely to have on innovation and knowledge sharing in the context of a university in a developing country, namely Zimbabwe. The Great Zimbabwe University (GZU) in Zimbabwe was selected as the unit of analysis.

1.2 Previous research

The concept of 'organisational culture' has been the focus of much research, with more than 70 instruments and approaches available for measuring it (Jung, Scott, Davies, Bower, Whalley, McNally, & Mannion, 2009). Previous research has shown that a conducive organisational culture enhances both innovation (see Büschgens, Bausch, & Balkin, 2013; Glisson, 2015; Naranjo, Jiménez, & Valle, 2015) and knowledge sharing (see Al-Alawi, Al-Marzooqi, & Mohammed, 2007; Rega, Naha, Mansor, & Ramayah, 2014).

Previous research on the impact of organisational culture focused on organisational variables such as competitive advantage (Bogdanowicz, 2014); organisational effectiveness (Hartnell, Ou, & Kinicki, 2011); organisational performance (Naor, Linderman, & Schroeder, 2010), service quality (Kokt & Van der Merwe, 2009) and total quality management (Zu, Robbins, & Fredendall, 2010; Valmohammadi & Roshanzamir, 2015).

Previous research on organisational culture and innovation identified specific elements that influence innovation in organisations such as interfunctional cooperation (Fernández Sastre & Vera, 2017); flexibility (Naranjo *et al.*, 2015); risk taking (Tellis, Prabhu, & Chandy, 2009; Naranjo *et al*., 2015); and participative decision making (Isaksen & Ekrall, 2010). In the same vein, previous research on organisational culture and knowledge sharing established specific variables that have a bearing on knowledge sharing. These include trust (Chen, Lin, & Yen 2014); attitudes and actions of managers (Fullwood, *et al.,* 2013); opportunities for interaction (Sandhu, Jain, & Ahmad, 2011) and a shared vision (Rega *et al.*, 2014).

More recent studies on the impact of organisational culture on innovation have largely been confined to manufacturing firms (see Büschgens *et al.*, 2013; Glisson, 2015; Naranjo *et al.*, 2015) and service firms (Hogan & Coote, 2014). Recent studies on organisational culture and knowledge sharing have focused on the following sectors: the public sector (see Al-Alawi *et al.*, 2007; Al-Busaidi & Olfman, 2017, Sandhu *et al.*, 2011) the hospitality sector (Hu, Horng, & Sun, 2009) and the information technology (IT) service sector (Li, 2010). These studies are part of a growing body of evidence which confirms that a conducive organisational culture can have a positive impact on innovation and knowledge sharing.

Some of the leading organisational culture frameworks are: the Levels of Organisational Culture Framework (Schein, 2004); the Dimensions of National Culture Framework (Hofstede, 2011); the Denison Organisational Culture Model (Denison, 1990); and the Competing Values Framework (CVF) of Cameron and Quinn (2006). The CVF, a robust measure of organisational culture, was selected for the study due to its applicability and the fact that it was used in mapping the organisational culture profiles of over 10 000 organisations globally. The CVF has also been applied in numerous studies on organisational culture (see Bogdanowicz, 2014; Büschgens *et al.*, 2013; Cho, Kim, Park, & Cho, 2013; Grabowski, Neher, Crim, & Mathiassen, 2015; Hartnell *et al*., 2011; Kokt & Van der Merwe 2009; Landekic, Sporcic, Martinic, & Bakaric, 2015; Lindquist & Marcy, 2016; Naranjo *et al*., 2015; Trivellas & Dargenidou, 2009; Zu *et al*., 2010).

Research on innovation has been growing and spans across many disciplines such as Sociology, Psychology, Business Administration and Public Management (Damanpour

& Aravind, 2012). Many authors agree that innovation has a positive impact on competitive advantage (see Aziz & Samad, 2016; Coccia, 2017; Crossan & Apaydin, 2010; Naranjo *et al.*, 2010; Petrakis, Kostis, & Valsamis, 2015). The growing body of literature also suggests that innovation enhances firm performance (see Arts, Norman, & Hatfield, 2010; Camisón & Villar-López, 2014; Gunday, Ulusoy, Kilic, & Alpkan, 2011; Kafetzopoulos & Psomas, 2015; Rosli & Sidek, 2013; Sadikoglu & Zehir, 2010; Silva, Styles, & Lages, 2017; Visnjic, Wiengarten, & Neely, 2016).

Similar to organisational culture and innovation, knowledge sharing has become a widely researched topic. This can be ascribed to the emergence of the knowledge economy. Prior research suggests that knowledge sharing enhances organisational variables such as competitive advantage (see Li, Roberts, Yan, & Tan, 2014; Navimipour & Charband, 2016); innovation (see Colombo, Laursen, Magnusson, & Lamastra, 2011; Kamaşak & Bulutlar, 2010; Obeidat, & Tarhini, 2016) and job satisfaction (see Kianto, Vanhala, & Heilmann, 2016; Trivellas, Akrivouli, Tsifora, & Tsoutsa, 2015).

From the above, it is clear that organisational culture, innovation and knowledge sharing have become popular areas of research. A study on the impact of organisational culture on innovation and knowledge sharing in universities is long overdue, especially given the growing impetus from Zimbabwean policymakers for local universities to lead economic industrialisation and modernisation. As indicated before, previous research on this topic has largely focused on developed countries (see Al-Alawi *et al.,* 2007; Fullwood *et al.*, 2013; Sadiq & Daud, 2009), whilst research of this nature in developing countries is limited (Fullwood *et al.*, 2013).

1.3 Problem statement

Innovation and knowledge sharing are the defining characteristics of an organisation that is successful in the long term (Kamaşak & Bulutlar, 2010). This is especially pertinent in the new world of work, where organisations are fiercely competing for market share and growth. The same applies to universities: As reservoirs of knowledge, they are expected to be innovative in addressing numerous societal challenges. In this, an enabling and conducive organisational culture should support innovation and knowledge sharing (Al-Alawi *et al.*, 2007; Glisson, 2015).

Despite the benefits of innovation and knowledge sharing in the new world of work, developing countries are *less* innovative than developed countries (Cirera & Maloney, 2017), which is also true for Zimbabwe. An examination of Zimbabwe's innovation output profile reveals that this country is ranked 113 out of 126 countries on the Global Innovation Index (Dutta, Lanvin & Wunsch-Vincent, 2018). On indices regarding knowledge and technology output and university–industry collaboration, the country is ranked 83 and 116 out of 126 countries respectively (Dutta *et al.*, 2018). Not only are developing countries less innovative than advanced countries, but, as Cirera and Maloney (2017) observed, literature on innovation is scarce in developing countries compared to developed countries (see Büschgens *et al.*, 2013; Fullwood *et al.*, 2013; Hogan & Coote, 2014; Naranjo *et al*., 2015; Tellis *et al.*, 2009).

The inability of Zimbabwe to fully harness its innovation and knowledge creation potential motivated this research (Dutta *et al*., 2018). Due to this inability, organisations and universities in Zimbabwe are likely to lack innovation and knowledge sharing. To investigate the extent of the impact of organisational culture on innovation and knowledge sharing at a university in a developing country, the GZU was selected as a unit of analysis as it was accessible to the researcher. The aim of the study was to propose a strategic framework to facilitate innovation and knowledge sharing at GZU.

1.4 Main research question

What is the impact of organisational culture on innovation and knowledge sharing at GZU?

1.4.1 Research sub questions

1. What is the prevailing organisational culture of GZU?
2. What is the level of innovation at GZU?
3. What is the level of knowledge sharing amongst GZU staff?
4. What is the impact of the existing organisational culture on the levels of innovation at GZU?

5. What is the impact of the existing organisational culture on knowledge sharing at GZU?
6. What is the impact of knowledge sharing on innovation at GZU?
7. What strategic framework can be proposed to facilitate innovation and knowledge sharing at GZU?

1.5 Main research objective

The main objective of this investigation was to establish the impact of organisational culture on innovation and knowledge sharing at GZU.

1.5.1 Sub objectives

1. To determine the prevailing organisational culture of GZU.
2. To establish the levels of innovation prevalent at GZU.
3. To measure the levels of knowledge sharing amongst the staff at GZU.
4. To determine the impact of the existing organisational culture on innovation at GZU.
5. To determine the impact of the existing organisational culture on knowledge sharing at GZU.
6. To determine the impact of knowledge sharing on innovation at GZU.
7. To propose a strategic framework for facilitating innovation and knowledge sharing at GZU.

1.6 Research philosophy/paradigm

Ontology is concerned with individuals' beliefs regarding what constitutes social reality (Scotland, 2012), that is, whether individuals believe there is one verifiable reality or multiple, socially constructed realities (Patton, 2002). The current study adopted the ontological position of objectivism which asserts that social phenomena and their meanings exist independently of social actors (Grix, 2002). This means that a distant, neutral and non-interactive position was maintained between the researcher and the research subjects.

Epistemology is concerned with the theory of knowledge, especially methods, validation and the possible ways of gaining knowledge about how social reality is constructed (Grix, 2002). This study adopted the epistemological stance of positivism because the researcher believes in the scientific quantification of research results to enhance precision in the description of parameters. Furthermore, the researcher and the researched were independent entities. The quantification of research results and the non-manipulation of the research process are major underpinnings of positivism (see Chilisa & Kawulich, 2012; Scotland, 2012). The adoption of positivism in this study is supported by previous research on organisational culture (see Bock, Zmud, Kim, & Lee, 2005; Jolaee *et al.*, 2014; Kamasak & Bulutlar, 2010).

1.7 Research approach and design

There are three major approaches in research: the quantitative approach, the qualitative approach and the mixed-methods approach (Creswell, 2017). The quantitative approach can be defined as research in which numerical data are collected and analysed statistically using mathematically based methods (Creswell, 2017). The qualitative approach is an inductive, interpretive and naturalistic approach to the study of people, cases, phenomena, social situations and processes in their natural settings in order to reveal in descriptive terms the meanings that people attach to their experiences of the world (Yilmaz, 2013). The mixed-methods approach is a combination of the quantitative and qualitative approaches.

The nature of this study necessitated the use of the quantitative approach because it emphasises the measurement and statistical analysis of causal relationships between isolated variables (Yilmaz, 2013). This approach is also conducive to researching large populations – as was the case in this study. The quantitative approach has been used in similar studies on the topic (see Büschgens *et al.*, 2013; Hogan & Coote, 2014; Fullwood *et al.*, 2013).

A research design is a master plan that specifies the methods and procedures for collecting and analysing the needed information (Zikmund, Babin, Carr, & Griffin, 2010). Yin (2003) concurs by defining a research design as a blueprint or plan on how data are to be collected, analysed and interpreted.

The current study adopted a survey design. According to Creswell (2017), a survey design is a type of inquiry that provides a quantitative or numeric description of the trends, attitudes or opinions of a population by studying a sample of the population. A survey design was found suitable for this study because it supports the quantitative analysis of research results (Saunders, Lewis, & Thornhill, 2009). In a survey design the researcher does not manipulate any of the variables under investigation (Bryman & Bell, 2011), which is in line with the ontological position of objectivism adopted in this study.

1.8 Ethical considerations

Ethical behaviour is important in conducting research, as in any other field of human activity. Ethical considerations come into play at three stages of an investigation, namely:

- When individuals are selected to partake in the investigation: In the current study, participants were requested to take part in the research process on a voluntary basis. This was done to ensure that participants were willing to be part of the process.
- During the surveying process: This study used the SurveyMonkey platform to collect data. This was done to ensure the participants' privacy and confidentiality during the survey process.
- When the findings of the study are released (Welman, Kruger, & Mitchell, 2007): A full report of this study will be availed to GZU to inform them about the outcome of the study.

The following ethical considerations were also adhered to in the study:

- Privacy was maintained at all times. All information that was gathered was treated as confidential, and the identities of the subjects were protected.
- The research was designed, conducted and reported in accordance with recognised standards of scientific competence and ethical research. This entailed using a survey design to collect data and reporting research results using the appropriate descriptive and inferential analysis techniques.
- Respondents participated voluntarily in the investigation, having given informed consent.

1.9 Limitations of the study

Limitations are shortcomings or conditions which cannot be controlled by the researcher and have an effect on the research results or interpretation and application of the results. The major limitation of the research component of this study was its restriction to only one university in Zimbabwe. There are 19 universities in the country. This, however, did not affect the validity of the research results.

1.10 Significance and value of the study

The study provides a basis for future research on the issue of organisational culture and its impact on innovation and knowledge sharing, especially at universities. Furthermore, it provides a strategic framework for university managers striving to enhance innovation and knowledge sharing.

1.11 Chapter overview

The investigation is set out in the following chapters:

Chapter 1: Introduction
Chapter 1 provides the background of the study and details the aims, objectives and the research questions of the study. It also outlines the research methodology adopted in the study, the limitations of the study and the significance of this study.

Chapter 2: Conceptualising organisational culture
Chapter 2 deals with the literature pertaining to organisational culture. It explains the term ‘organisational culture’ and the levels and characteristics of organisational culture. It also discusses the CVF which served as the conceptual guide for constructing the questionnaire.

Chapter 3: Innovation and knowledge sharing in a university context
Chapter 3 outlines innovation and knowledge sharing and the theoretical perspectives on which these two variables are based.

Chapter 4: The evolution of universities with special reference to Great Zimbabwe University

Chapter 4 discusses the changing nature of global universities from being collegial bodies to the present focus on new managerialism. It provides a historical overview of the university sector in Zimbabwe and its significance to national development. The chapter also discusses the challenges confronting universities in Zimbabwe and gives an extensive description of GZU.

Chapter 5: Research methodology

Chapter 5 presents a discussion of the methodology that was adopted in the study with regard to philosophical stance, research design, data-gathering instrument, population and sample, and challenges related to fieldwork.

Chapter 6: Discussion and analysis of findings

Chapter 6 sets out the data analysis and the findings of the empirical investigation.

Chapter 7: Conclusions and recommendations

Chapter 7 provides conclusions based on the analysis of the findings and puts forth a strategic framework that GZU can adopt.

1.12 Summary

This chapter focused on motivating the need for the study. In an ever-changing environment that is associated with intense competition, a conducive organisational culture that promotes innovation and knowledge sharing is paramount. The chapter reviewed previous research on the impact of organisational culture on innovation and knowledge sharing to give a clear perspective of the relationship amongst the three variables. It also delineated the main and subsidiary objectives and research questions for the study. The philosophical stance and methodological considerations for the study were stated, including relevant ethical aspects. The chapter concluded with a layout of the rest of the study.

CHAPTER 2: CONCEPTUALISING ORGANISATIONAL CULTURE

2.1 Introduction

The concept of ‘culture’ has a long history linked to the field of Anthropology. Anthropology broadly focuses on the physical, social and cultural development and behaviour of ancient and contemporary humans (Bailey & Peoples, 2012). The concept is also deeply rooted in the fields of Sociology and Social Psychology. Sociology is the systematic study of human behaviour and the interaction of people in the societies they create (Hess, Markson, & Stein, 1996), whereas Social Psychology seeks to understand the nature and causes of individual behaviour in social situations (Baron, Byrne, & Suls, 1989). From the above, it is apparent that Anthropology, Sociology and Social Psychology generally focus on the development and functioning of humans and human societies. In a human society, the interaction amongst people usually leads to the development of behavioural patterns that are unique to particular societies. These learned behavioural patterns form a durable template which consists of long-lasting common beliefs that guide perpetual societal interaction and evolve into what is known as ‘human culture’.

Human culture enables individuals to fit in as members of a particular society (Bailey & Peoples, 2002). It spells out acceptable behaviour that is expected from an individual to be able to belong and fit in as a member of a particular society. This is also true for organisations. Researchers (see O’Reilly, Chatman, & Caldwell, 1991; Tsai, 2011) seem to agree that an organisation’s culture may be an important factor in determining how well individuals would fulfil the specific expectations of an organisation, in other words, how well they would fit in. Organisational culture spells out behaviour that conforms to the norms and expectations of the organisation. It can therefore be reasoned that organisational culture is the glue that binds together the people in organisations.

Organisational culture is a powerful ingredient for organisational success (Cameron & Quinn, 2011). This is because organisational culture elicits a unified effort from individual employees (Kokt & Ramarumo, 2015). Urbancová (2012) concurs by suggesting that the culture of an organisation strengthens employee attitude towards work and regulates

relationships amongst employees. The strong bond amongst employees can result in the development of a sense of belonging to the organisation. It is therefore not surprising that organisational culture has been identified as a source of competitive advantage (Bogdanowicz, 2014; Testa & Sipe, 2013).

Although technology, market presence and corporate strategy are prerequisites for organisational effectiveness, a unique organisational culture is a powerful tool that sets an organisation apart from a sea of competitors. Cameron and Quinn (2011) argue that high corporate performance is usually a direct result of a strong organisational culture where employees ascribe to unique unified norms and values. The inimitability of organisational culture means that the specific culture cannot be replicated.

The purpose of this chapter is to first provide insight into the concept of 'organisational culture' and the characteristics, levels, functions, determinants and current issues related to organisational culture. Secondly, the differences between organisational culture and climate will be explained, as the two terms are distinct yet often used interchangeably. Lastly, the CVF, which served as the conceptual guide for the empirical investigation, will be discussed.

2.2 Explaining organisational culture

Cameron and Quinn (2011) observed that, from the early 1980s, the concept of 'organisational culture' began receiving serious attention from prominent scholars such as Peters and Waterman (1982); Handy (1985); Schein (1980, 1983, 2004); Johnson and Scholes (1988); and O'Reilly *et al*. (1991). The diverse bodies of research on organisational culture have proposed many definitions of the construct (Jahoda, 2012), of which the most important are discussed below.

Deshpande and Webster (1989) define organisational culture as a pattern of shared values and beliefs that help individuals understand organisational functioning and, in this way, provide norms for behaviour in the organisation. This definition resonates with the view of Schein (1980, 1983, 2004) who defines organisational culture as a set of distinctive beliefs, symbols, values and basic assumptions shared by members of an organisation.

According to Cameron and Quinn (2006), organisational culture reflects the taken-for-granted values, underlying assumptions, collective memories and unwritten memories that guide people in an organisation. This definition corresponds with Johnson and Scholes' (1988) view which describes organisational culture in terms of stories, rituals, routines, symbols, organisational structures, control systems and power structures. In the same vein, Cummings and Worley (2009) see organisational culture as a representation of artefacts, norms, values and basic assumptions that are more or less shared by organisation members.

An analysis of the definitions reveals a common thread, namely that organisational culture has to be shared by members of the organisation for it to be binding. A shared understanding contributes to a 'meeting of the minds' of people in an organisation, in other words, people would be likely to direct their efforts towards the same goal. Hofstede (2011) describes the meeting of the minds as the collective programming of the mind of the people in an organisation. It can therefore be reasoned that the shared view present in organisational culture acts as the glue that binds individual members together.

For the purposes of this research, organisational culture is defined as the distinctive, basic underlying and shared assumptions, espoused values, symbols, artefacts and attitudes that collectively describe an organisation. This corresponds with the views of Mullins (2010), Cummings and Worley (2009), Schein (2004), and Deshpande and Webster (1989).

The culture of an organisation plays a boundary-defining role in that it distinguishes one organisation from others (Robbins & Judge, 2013). Internal and external stakeholders identify with an organisation because of its culture. For example, Apple Inc. is known for its innovation capability in the high-tech industry all over the world. Also, strong organisational culture conveys a sense of identity for members and generates a sense of positive commitment. Employees develop a sense of commitment towards those organisations with which they share beliefs. Finally, organisational culture enhances the stability of the social system in organisations by providing standards and guidelines, such as standard operating procedures and codes of conduct, which guide the behaviour of members.

2.3 Levels of organisational culture

According to Schein (2004), organisational culture consists of three levels: artefacts and creations; values and beliefs; and basic assumptions. Basic assumptions operate on an unconscious level where certain perceptions, thoughts and feelings are taken for granted. These assumptions impact the values and beliefs of individuals which, in turn, affect the visible behaviour or artefacts. These levels are explained in figure 2.1 below.

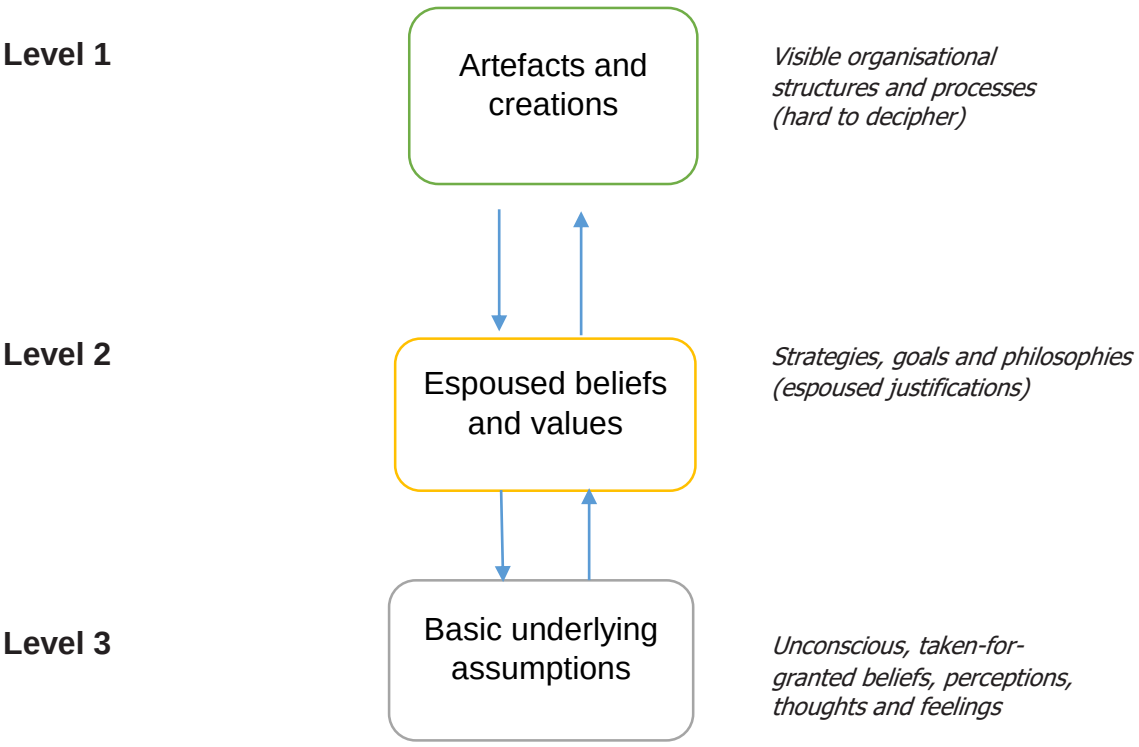


Figure 2.1: The levels of culture

Source: Schein (2004)

The levels of culture are explained below.

Level 1: Artefacts. Artefacts are words, verbal expressions, pictures or objects that carry a particular meaning within a culture (Van Wijk & Finchilescu, 2008). They are the visible elements at the surface of the organisation and include all the phenomena that one sees, hears and feels when one encounters a new group with an unfamiliar culture (Schein, 2004). Mullins (2010) suggests that artefacts reflect the most visible level of organisational culture, encompassing the constructed physical and social environment. In an organisation artefacts are represented by things such as physical space and

layout, the technological output, written and spoken language, the overt behaviour of group members, logos, corporate clothing, the organisational structure and products.

Level 2: Espoused values and beliefs. Values are inner feelings that are rarely discussed. Although unobservable, they manifest in the behavioural patterns of organisational members (Schein, 2004). Values define what is important in the organisation and what deserves members' attention (Cummings & Worley, 2009). Key values in organisations may include exceptional customer service, transparency and emphasis on radical innovations. On the other hand, beliefs reflect solutions that have been tested and proven in specific situations (Schein, 2004). Beliefs are shared by members because they have been instrumental in organisational functioning. Values and beliefs thus become part of the conceptual process by which group members justify actions and behaviour (Mullins, 2010).

Level 3: Basic underlying assumptions. Basic assumptions are the taken-for-granted beliefs that determine how group members perceive, think and feel about organisational functioning (Mullins, 2010). Basic assumptions develop as a result of particular solutions which have been applied so many times that they have become an established way of doing things, for example, when advertising becomes an established way to respond to declining sales due to the fact that advertising was used successfully in the past to enhance falling sales. These assumptions are generally non-confrontable and non-debatable and extremely difficult to change (Schein, 2004).

2.4 The determinants of organisational culture

The culture and structure of an organisation develop over time and in response to a complex set of factors (Mullins, 2010). The development of organisational culture is associated with the beliefs of the founders of the organisation, their personalities and their preferred way of doing things. Founders of organisations hire employees and indoctrinate and socialise them to their way of thinking and feeling (Robbins & Judge, 2013). Furthermore, the behaviour of the founders shapes employees' values, beliefs and assumptions. When employees identify with the founders and their ways of doing things, the 'personality' of the founders has become entrenched into the organisation's culture (Robbins & Judge, 2013).

A number of key influences play an important role in the development of organisational culture. These include history, primary function and technology, the size of the organisation, location, the way in which the organisation is managed and staffed, and the environment. Each will be discussed below.

History: The path that the organisation took during its formation influences its culture. The vision, philosophy and values of its owners and first senior managers will be reflected in the organisational culture (Mullins, 2010). The values and beliefs of the owners and senior executives shape the general way in which things are done in the organisation. The top leadership wants their valued opinions to be reflected in the operations of the organisation. If the top leadership values innovation or customer service, this is likely to cascade down to the lower hierarchies of the organisation and become part of its culture.

Primary function and technology: The nature of the organisation's business and its primary function have an important influence on its culture (Mullins, 2010). The primary function of the organisation is likely to determine the nature of the technological processes and methods of performing work. In high-tech organisations, products are likely to be of high quality and the organisation would require a flexible culture that embraces the ever-changing technologies in the external environment.

Size: Larger organisations are likely to have more formalised structures and cultures (Mullins, 2010) because of the need to maintain stability. An increase in size is likely to result in separate departments and split-site operations. This may cause difficulties in communication and interdepartmental rivalries, creating the need for effective co-ordination. This, in turn, is likely to force management to create structures that foster communication amongst departments and divisions.

Location: Geographical location and the physical characteristics of where an organisation is located, for example, in a quiet rural area or busy city centre, can have a major influence on the organisation's culture (Mullins, 2010). Organisations located in towns and cities are likely to have more pragmatic cultures (i.e., market driven and flexible). Usually, urban customers are more informed than their rural counterparts,

hence they demand exceptional service. This means a customer responsive culture is more appropriate in such cases. Rural locations might be associated with stable organisational cultures – this is because the pace of change in rural locations is likely to be slower.

Management and staffing: Top executives can have considerable influence on the nature of organisational culture (Mullins, 2010). The leadership of an organisation shapes its culture through policies and procedures, aligning the way management and operations are executed. An organisation can either be highly innovative or stable, depending on the orientation of its leadership.

Environment: The environment encompasses the internal and external factors that affect the performance of a business and is a key variable in influencing organisational culture (Mullins, 2010). To be effective, the organisation must be responsive to external environmental influences. If the organisation operates within a dynamic environment, it requires a culture that is sensitive and readily adaptable to change – a flexible culture is the most suitable in this instance. A flexible organisational culture is one that responds quickly to various demands from a dynamic competitive environment (Ngo & Loi, 2008). Organisations with flexible cultures are likely to respond effectively to new opportunities, challenges, risks and limitations presented by the ever-changing external environment.

2.5 Characteristics of organisational culture

Robbins and Coulter (2013) and Robbins and Judge (2013) identified seven primary characteristics of organisational culture that distinguish one organisation from another, namely innovation and risk taking, attention to detail, outcome orientation, people orientation, team orientation, aggressiveness, and stability. Each will be discussed below.

Innovation and risk taking: Innovation and risk taking refer to the degree to which employees are encouraged to be innovative and take risks (Robbins & Judge, 2013). Innovation is the process of formulating and implementing new product and service ideas to create value for an organisation. It is considered to be one of the key factors in

the long-term success of a company in the competitive markets (Naranjo *et al.*, 2015). Pioneering has its fair share of risks, hence innovation and risk taking go hand in hand.

Attention to detail: Attention to detail refers to the degree to which employees are expected to exhibit precision and analysis in their work (Robbins & Judge, 2013). An organisation that is characterised by attention to detail tends to be meticulous and focused on minimising mistakes. All organisational processes are fine-tuned to ensure precision to avoid costly mistakes. For example, organisations in the medical field pay great attention to detail, because the slightest mistake could result in loss of life, with detrimental consequences for the business.

Outcome orientation: Outcome orientation pertains to the degree to which managers focus on results or outcomes rather than on how these results or outcomes are achieved (Robbins & Coulter, 2013). These organisations pay more attention to results than the processes used to achieve the results. Sports teams usually are outcome oriented.

People orientation: People orientation refers to the degree to which management takes into account the effect of their decisions on the employees in the organisation (Robbins & Coulter, 2013). Decisions taken by management can have either a positive or negative impact on employees; hence a people-oriented approach implies that senior managers are sensitive about the impact their decisions are likely to have on employees. Decisions that enhance the commitment of employees to the organisation are likely to be implemented in people-oriented organisational cultures. In such cultures management attempts to create a congenial environment in which employees can thrive. The rationale is that, if people are satisfied in the workplace, they can direct their efforts towards goal accomplishment.

Team orientation: Team orientation entails the degree to which work is organised around teams rather than individuals (Robbins & Judge, 2013). The emphasis is on teams as a way of enhancing synergy and producing outputs that individuals working alone cannot. Teams benefit from the cross-pollination of members' opinions and ideas when carrying out team assignments.

Aggressiveness: Aggressiveness describes the degree to which employees are competitive rather than easy going (Robbins & Coulter, 2013). Organisations that are aggressive take calculated risks in anticipation of high returns. They benefit from the first-mover advantage. Aggressiveness is a key requirement in highly competitive markets where the barriers to entry and exit are low.

Stability: Stability refers to the degree to which organisational decisions and actions emphasise the maintenance of the status quo rather than growth (Robbins & Coulter, 2013). Whereas some organisations believe that constant change is the key to growth, organisations emphasising stability focus on keeping their operations stable. This normally happens in mature markets.

2.6 Strong and weak organisational cultures

There are two contrasting variations of organisational culture: a strong culture and a weak culture. An organisational culture is considered strong when the core values of the organisation are intensely held and widely shared by the members (Robbins & Coulter, 2013). In a strong-cultured organisation there is high agreement amongst members concerning specific beliefs, assumptions, traditions and rituals. This may lead to an internal climate of behavioural control and organisational commitment and cohesiveness (Robbins & Judge, 2013).

On the other hand, an organisational culture is weak when there is little cohesion regarding beliefs, behavioural rules, traditions, heroes and rituals amongst members (Robbins & Judge, 2013). A weak organisational culture is associated with unhealthy characteristics that impede the organisation's success such as resistance to change and isolated thinking. Business managers should therefore strive to build strong organisational cultures. Table 2.1 below shows the characteristics of strong and weak cultures.

Table 2.1: Strong versus weak organisational cultures

Strong cultures	Weak cultures
Values widely shared	Values limited to a few people, usually top management
Culture conveys consistent messages about what is important	Culture sends contradictory messages about what is important
Most employees can tell stories about the company history or heroes	Employees have little knowledge of company history or heroes
Employees strongly identify with culture	Employees have little identification with culture
Strong connection between shared values and behaviours	Little connection between shared values and behaviours

Source: Robbins & Coulter (2013)

Table 2.1 above shows the major characteristics of strong and weak organisational cultures. In a strong organisational culture, values are widely shared, whereas in a weak organisational culture, values are limited to a few people. This means that most people know what is important in a strong organisational culture, as opposed to a weak organisational culture. Also, in a strong organisational culture, employees identify with the organisation. This generates a sense of commitment to the organisation and a unity of purpose amongst employees. Employees in a strong organisational culture are able to tell stories about how the organisation was formed, in contrast with employees in a weak organisational culture. This indicates effective communication in strong organisational cultures as compared to weak organisational cultures.

The concept of organisational culture has become a key component in organisational behaviour (Hartnell *et al*., 2011) and a critical ingredient in business management worldwide. For this reason organisational culture has become a well-researched construct.

2.7 Sustaining organisational culture

Sustaining organisational culture is just as important as developing organisational culture, which was discussed above. The diagram (figure 2.2) below summarises how organisational culture is created and sustained.

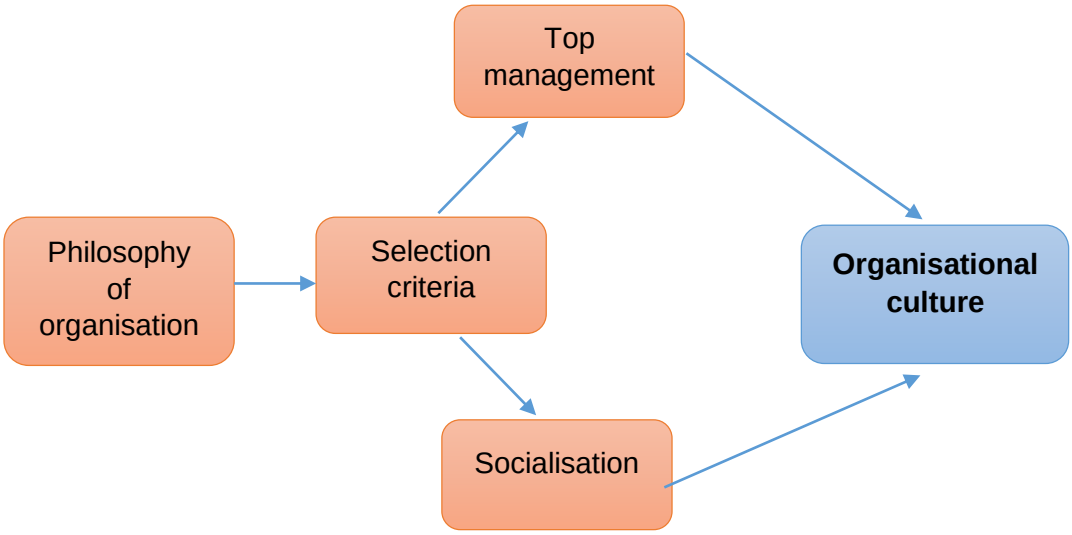


Figure 2.2: How organisational culture forms

Source: Robbins and Judge (2013)

Figure 2.2 shows how organisational culture is created and sustained. As indicated before, top management plays a pivotal role in selecting people who fit the organisational ethos. This includes socialisation where employees are taught the acceptable ways to react and interact in the organisational context. The section below discusses the importance of selection, top management and the socialisation process in creating and sustaining organisational culture.

Selection: Individuals need to be selected whose values are consistent with those of the organisation (Robbins & Judge, 2013). In so doing, individuals will be able to fulfil the expectations of the organisation. The selection process provides employers with a perfect opportunity to avoid a mismatch between their values and employees' values. This means the organisational culture can be sustained because the values of individual employees correspond with those of the organisation.

Top management: The actions of top management influence the behaviour of all employees in the organisation which, in turn, helps to sustain the culture. Senior executives establish norms regarding organisation variables such as risk taking, autonomy and human resource practices (Robbins & Judge, 2013). These norms act as a template that is applied throughout the organisation in various processes.

Socialisation: Socialisation is the process that helps employees adapt to an organisation through indoctrination and learning (Robbins & Judge, 2013). When employees are not informed and mentored regarding expected behaviour, disruption in the organisation may follow. Socialisation ensures that the organisation's 'way of doing things' is embedded in the behaviour of new employees. Indoctrination can pertain to the values of the organisation such as customer service, innovation, teamwork and knowledge sharing.

2.8 Culture as a liability

Although a strong organisational culture can benefit the organisation, it could be a liability when the existing culture has become dysfunctional. A dysfunctional organisational culture implies that the culture does not advance the interests of the organisation in the marketplace. This occurs when the organisation has become institutionalised and the culture begins to act as a barrier to change, diversity and acquisitions and mergers (Robbins & Judge, 2013). These aspects will be explained below.

Institutionalisation: This occurs when the culture of an organisation becomes so strong that it takes a life of its own apart from its founders or any of its members (Widén-Wulff, 2009). When an organisation culture takes on institutional permanence, acceptable modes of behaviour become largely self-evident to members. Some behaviours and habits that should be questioned may be taken for granted, which can stifle organisational effectiveness (Robbins & Judge, 2013).

Culture as a barrier to change: Organisational culture may present a barrier to change when the shared values of members do not agree with those that further the organisation's effectiveness (Robbins & Judge, 2013). An entrenched organisational

culture can be an impediment to change when it has become stagnant in a rapidly changing environment. An ideal situation is when a company responds to a change in the environment with a change in organisational culture.

Culture as a barrier to diversity: Strong organisational cultures can limit the benefits associated with a diverse workforce (Robbins & Judge, 2013). When new employees join an organisation they are expected to conform to the core values of the new environment. Thus, new employees are not given the latitude to express themselves, which stifles the innovative thinking expected from a diverse body of employees. The unique strengths that they have possessed prior to joining the new organisation diminish. This, in turn, hampers the ability of the organisation to benefit from the diversity associated with new entrants.

Culture as a barrier to acquisitions and mergers: Cultural compatibility has become the primary concern in acquisitions or merger considerations (Robbins & Judge, 2013). Cross-cultural differences can act as an impediment to mergers, resulting in organisations' being unable to realise their value goals. The failure to achieve organisational objectives can be rooted in differences in management style and the inability to integrate the conflicting views of the human element in mergers or acquisitions (Weber & Yedidia, 2012).

2.9 National and industry cultures

Organisational culture applies to a specific organisation. When the concept is applied to a nation, it is commonly referred to as 'national culture', and when applied to an industry, it is referred to as 'industry culture'. These two concepts are discussed below.

2.9.1 National culture

As indicated before, national culture applies to a whole country. People from the same country are assumed to share similar cultural practices and values (Theron & Liebenberg, 2015) which leads to the development of a national culture. The assumption here is that, by virtue of membership of a specific country, people are exposed to a similar learning experience; hence they develop a collective way of social interaction.

Hofstede's (1980) framework of dimensions of national culture will be applied in this section to analyse the concept of national culture. Hofstede's work provides researchers with a consistent way of quantifying cultural differences amongst countries (Beugelsdijk, Kostova, & Roth, 2017). For this reason, the framework has become the most widely accepted means by which to quantify dominant national cultural values (Reisinger & Crotts, 2010). The components of the national culture framework are discussed below, as set out by Hofstede (2011):

Power distance

Power distance refers to the extent to which the less powerful members of organisations and institutions (like the family) accept and expect power to be distributed unequally (Hofstede, 2011). It suggests that followers accept and endorse society's level of inequality. In countries with high power distance indicators, such as in Eastern Europe, Asia and Africa (Hofstede, 2011), organisational structure tends to be more centralised and rigid. Decision-making information is the preserve of those in authority (Efrat, 2014). In low power distance societies like Germanic and English-speaking countries (Hofstede, 2011), equality is valued amongst members, and democratic forms of participation are encouraged (Rinne, Steel, & Fairweather, 2012). With this in mind, there is a likelihood of decentralisation of decision making in a society with a low power distance.

Uncertainty avoidance

Uncertainty avoidance relates to the degree of anxiety which society members feel in uncertain or unknown situations (Kulkarni, 2012). It deals with a society's tolerance of the unpredictable (Hofstede, 2001). In low uncertainty avoidance societies like English-speaking, Nordic and Chinese culture countries (Hofstede, 2011) people tend to be more open to change and new ideas, whereas members of high uncertainty avoidance societies, like in East and Central Europe and Latin countries, tend to perceive novelty as dangerous and hence resist it (Efrat, 2014). This means innovation thrives in countries with low uncertainty avoidance.

Individualism vs collectivism

Individualism refers to the degree to which, for each individual in a given group, his or her interests prevail over the interests of the group (Efrat, 2014). According to Kulkarni (2012), individualism is a reflection of the strength of the ties people have to others within the community. In individualistic cultures like in Western European countries (Hofstede, 2011) ties amongst individuals are loose and people are expected to look after their own interests.

On the other hand, collectivism refers to a society where individuals are integrated into strong cohesive groups (Meeuwesen, Van den Brink-Muinen, & Hofstede, 2009). In a collectivist culture, the focus is on creating and maintaining healthy relationships. Therefore, one can expect a collectivist culture to promote teamwork and the sharing of ideas. Collectivism prevails in less developed and East European countries (Hofstede, 2011).

Masculinity vs femininity

In the current context, masculinity refers to the extent to which a society holds on to, and values, traditional male and female roles (Kulkarni, 2012). Masculinity is concerned with a reflection of the relative strength of masculine vs. feminine values in a society (Hofstede, 2001). A society is labelled masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough and focused on material success, whereas women are supposed to be modest, tender and concerned with quality of life (Hofstede *et al.*, 2005). In countries ranked higher on the masculinity index, like Japan, German-speaking countries, Italy and Mexico (Hofstede, 2011), the emphasis is on ego, money, performance and achievements (Hofstede, 2011). In feministic cultures like in the Nordic countries and the Netherlands (Hofstede, 2011), the focus is on people, their quality of life, helping others, preserving the environment and not drawing attention to oneself (Rinne *et al.*, 2012). This means that there is a likelihood of a high degree of caring amongst people in a society that reflects a feministic culture.

2.9.2 Industry culture

Industry culture refers to organisations in the same industry that do things in a particular way. Since organisations operate within specific industrial subsectors, their culture can be categorised according to the degree of risk associated with their activities and the

speed at which they and their employees receive feedback on the success of decisions or strategies (Deal & Kennedy, 2000). Based on these categories, Deal and Kennedy (2000) proposed four generic types of industry culture, namely the tough-guy/macho culture; the work-hard/play-hard culture; the bet-your-company culture; and the process culture. Each will be discussed below.

Tough-guy/macho culture. This type of culture refers to an organisation of individualists who frequently take high risks and receive quick feedback on the right or wrong of their actions (Deal & Kennedy, 2000). Rewards might be high in this type of culture (Cacciattolo, 2014). Examples of industries with this type of culture are the police force, surgery, construction, cosmetics, management consulting and entertainment (Mullins, 2010). In these sectors financial stakes are high and decisions need to be made quickly. The intense pressure and frenetic pace often result in early burn-out. Internal competition and conflict are normal; stars are temperamental but tolerated. A high staff turnover can create difficulties in building strong cohesiveness.

Work-hard/play-hard culture. This type of culture is characterised by fun and action, little risk taking by employees, quick feedback (Deal & Kennedy, 2000), and a high level of relatively low-risk activities. Examples are sales organisations such as estate agents and computer companies, mass consumer companies, office equipment manufacturers and retail stores (Mullins, 2010). These organisations tend to be highly dynamic and highly focused on customers and their needs. Thus, exceptional customer service is prioritised (Cacciattolo, 2014), and proactivity is required most of the time. It is the team who produces the volume, and the culture encourages games, meetings, promotions and conventions to help maintain motivation.

Bet-your-company culture. This type of culture is characterised by large-stake decisions involving high risk but slow feedback so that it may be years before employees know whether decisions were successful (Mullins, 2010). Huge and costly decisions are taken in this type of culture (Cacciattolo, 2014). Examples include the oil industry, investment banking, architectural firms and the military (Mullins, 2010). The focus is on the future and the importance of investing in it. There is a sense of deliberateness throughout the organisation typified by the ritual of the business meeting. A hierarchical system of authority is maintained, with decision making from the top down. This culture

leads to high-quality inventions and scientific breakthroughs, but moves very slowly and is vulnerable to short-term fluctuations.

Process culture. This is a low-risk and slow-feedback culture (Mullins, 2010). In a process industry culture single transactions do not have a major impact on the organisation's success and it takes a long time to evaluate decisions and receive feedback. Employees therefore find it difficult to measure their work efforts. Typical industries are the banking industry, insurance industry and the civil or public service. Individual financial stakes are low and employees get very little feedback on their effectiveness (Cacciattolo, 2014). Memos and reports seem to disappear into a void, and a lack of feedback forces employees to focus on *how* they do something and not on *what* they do. People tend to develop a 'cover your back' mentality in this culture. Bureaucracy results, with attention to trivial events, minor detail, formality and technical perfection.

2.10 Organisational culture and organisational climate

Though often used interchangeably, 'organisational culture' and 'organisational climate' are distinct concepts (Neelam, Bhattacharya, Sinha, & Tanksale, 2015) which need to be clarified. Castro and Martins (2010) defined 'organisational climate' as the shared perceptions, feelings and attitudes that members have about the fundamental elements of the organisation. This resonates with the view of Mullins (2010), namely that organisational climate reflects the prevailing atmosphere surrounding the organisation, the level of morale, and the strength of feelings or belonging, care and goodwill amongst its members.

Mullins (2010) further noted that, whereas organisational culture describes what the organisation is about, organisational climate indicates the employees' feelings and beliefs regarding what the organisation is about. Organisational climate can therefore be viewed as tangible and observable practices, systems and outcomes (Langford, 2009). A summary of the differences between the two terms is provided in table 2.2 below (Castro & Martins, 2010).

Table 2.2: Differences between organisational climate and organisational culture

Organisational climate	Organisational culture
Has its roots in Social Psychology	Originates from Anthropology
Focuses on the individual's perceptions and cognitions	Focuses on the underlying structure of symbols, myths and rituals
Is more visible and operates at the level of attitudes and values	Is relatively invisible and is preconscious in individuals
Evolves quickly and changes rapidly	Evolves slowly and does not change easily
Unique characteristics of individuals are evident	Collective characteristics are exhibited

Source: Castro and Martins (2010)

Table 2.2 above shows the differences between organisational climate and organisational culture. As noted by McMurray and Scott (2013), organisational climate is rooted in the field of Social Psychology, whereas organisational culture originates from Anthropology. Organisational climate evolves more quickly than organisational culture. This means it is fairly easy to change the climate of an organisation than its culture. Lastly, organisational climate reflects individual characteristics, whereas organisational culture reflects a shared understanding held by members.

2.10.1 Perceptions on organisational climate

In line with Castro and Martins' (2010) view, namely that organisational climate is concerned with employee perceptions towards an organisation, McMurray and Scott (2013) divided the perceptions employees are likely to have towards organisational practices into eight major categories. These perceptions reflect the general employee's experience and feelings with regard to organisational practices. Table 2.3 below highlights the eight major perceptions:

Table 2.3: Major perceptions on organisational climate

Perception category	Description
Innovation	The perception that change and creativity are encouraged at the workplace
Autonomy	The perception of self-determination with respect to work procedures, goals and priorities
Cohesion	The perception of togetherness or sharing within the organisational setting including the willingness of members to provide material aid
Trust	The perception of freedom to communicate openly with members at higher organisational levels about sensitive or personal issues with the expectation that the integrity of such communications will not be violated
Pressure	The perception of time demands with respect to task competition and performance standards
Support	The perception of tolerance of member behaviour including willingness to let members learn from their mistakes
Recognition	The perception that members' contributions in the organisation are acknowledged
Fairness	The perception that organisational practices are equitable and non-arbitrary or capricious.

Source: McMurray and Scott (2013)

In today's competitive environment organisational climate is a key component in an organisation as it enhances performance variables. In a study conducted in the university sector, McMurray and Scott (2013) established that organisational climate facilitates staff participation and effective teaching. In the same study, organisational climate dimensions were found to be sources of competitive differentiation and advantage. The organisational climate construct is also associated with enhancing positive work attitudes such as organisational citizenship behaviour (Randhawa & Kaur, 2015) and job satisfaction (Castro & Martins, 2010).

2.11 Contemporary issues in organisational culture

A survey involving more than 10 000 human resources and business leaders across 140 countries revealed that organisational culture has become a top priority for contemporary corporate managers (Deloitte, 2017). In line with this finding, Robbins and Coulter (2013) suggested three contemporary organisational cultural issues that require increased managerial focus, namely creating an innovative culture, creating a customer-responsive culture, and nurturing workplace spirituality. These issues will be explained in the sections below.

2.11.1 Creating an innovative organisational culture

Organisational success hinges upon a supportive innovative culture (Efrat, 2014; Pučėtaitė, Novelskaitė, Lämsä, & Riivari, 2016; Sarooghi, Libaers, & Burkemper, 2015). Factors that stimulate an innovative organisational culture include risk taking, freedom, trust and openness, challenge and involvement, idea time and debates. These factors will be explained below.

Risk taking: Risk taking refers to the extent to which individuals in an organisation are encouraged to try out new ideas without being punished for making mistakes. Many researchers have identified risk taking as a critical variable in an innovative cultural environment (Dobni, 2008; Martínez-Román, Gamero, & Tamayo, 2011; Naranjo *et al*., 2010; Naranjo *et al*., 2017). Innovation encompasses the pioneering of new initiatives and the tolerance of uncertainty in the organisation. In a high risk-taking organisation, decisions and actions are taken promptly and rapidly, arising opportunities are taken, and concrete experimentation is preferred to detailed investigation and analysis. Organisations that are risk takers benefit from the first-mover advantage.

Freedom: Freedom relates to the extent to which employees define their work, exercise discretion and take initiative in their daily activities (Robbins & Coulter, 2013). People in an organisation need the latitude to experiment with their ideas. Martínez-Román *et al.* (2011) also pointed out that the decentralisation of decision making helps to promote innovation and creativity. This is because participation in decision making results in the development of a sense of devotion to the organisation, hence employees are likely to

think outside the box. In a work environment characterised by high employee participation, people make contacts, communicate freely and discuss problems. This type of environment stimulates creativity.

Trust: Trust measures the extent of reliability and confidence that people have towards one another. Trust reduces the cost of sharing information. When there is a strong level of trust, everyone in the organisation puts forward diverse ideas and opinions for the success of the organisation. When a diverse group of people knit together their ideas, the likelihood increases that they might come up with new and/or improved products and services. Initiatives can be taken without fear of reprisal and ridicule in case of failure. Where trust is lacking, people are suspicious of one another and wary of making expensive mistakes. In addition, they are afraid of being exploited and robbed of their good ideas.

Challenge and involvement: Challenge and involvement refer to the extent to which employees are involved, motivated and committed to the long-term goals of the organisation (Robbins & Coulter, 2013). Employees are motivated by highly challenging but realistic goals. The goal-setting process should be participatory to ensure a sense of belonging amongst employees. Employees' emotional involvement in the organisation's operations and goals creates high energy, a common sentiment and positive attitudes towards the business. This is likely to result in employees' being creative and innovative as they work towards goal attainment.

Idea support: Idea support refers to the extent to which ideas and suggestions are received by both co-workers and superiors. Aman, Rahman and Feisal (2015) argued that the support given to employees leads to creativity. This support can be in the form of rewards for those who generate new ideas (Martínez-Román *et al.*, 2011). When employees are rewarded for being creative, competition is created amongst employees as they seek to outcompete one another. Possibilities for trying new ideas are created, and people listen to one another and encourage one another to take initiative. This atmosphere is constructive and positive for innovation.

Idea time and debates: Innovative cultures create time for people to elaborate on new ideas before taking action (Robbins & Coulter, 2013). Debating allows for positive

criticism of viewpoints. Work groups and teamwork create a fertile ground for debating ideas as people from diverse backgrounds congregate to interrogate different opinions (Martínez-Román *et al*., 2011). In the high idea-time situation there are opportunities to discuss and test impulses and fresh suggestions that are not planned or included in task assignments. The cross-pollination amongst group or team members results in creativity and innovation.

2.11.2 Creating a customer-focused organisational culture

Given the intense competition, rapid technological revolution and high expectations of customers in the global market, organisations focus primarily on the customer as they strive towards superior service quality and value (Hu, Kandampully, & Juwaheer, 2009). Successful organisations should have a customer-oriented culture as the global marketplace has shifted from an industrial production to a service orientation (Carraher, Parnell, & Spillan, 2009).

A customer-focused organisational culture is enhanced by customer-focused behaviours, cross-functional teams and performance-based rewards (Rahimi, 2017b). These aspects are explained below.

Customer-focused behaviours lead to a better understanding of customers' requirements, which could contribute to the organisation's exceeding the minimum expectations of clients. Rahimi (2017a) argued that customer-focused behaviours such as an atmosphere of risk taking can create a climate of confidence in which employees feel empowered to act in the best interests of customers. When management encourages employees to be creative so as to delight the customer, employees develop the energy and zeal to achieve customer service excellence.

Cross-functional teams directed at customer service are an integral part of contemporary organisations. Teamwork enhances knowledge sharing as diverse team members' map out strategies to improve customer service. The diffusion of ideas in a team is closely associated with improved creativity in the workplace; hence it can lead to enhanced production and improved service delivery. This, in turn, may lead to an enhancement of customer service experience. Teamwork does not only lead to a

diffusion of ideas, but also enables a quick response to the dictates of the external environment. With a team-working strategy, the organisation is in a better position to monitor the environment and suggest areas of improvement to enhance customer service experience.

Performance-based rewards are motivational in nature. Rewards can be tied to exceptional customer service deliverables. A culture of rewarding high-performing employees inculcates an environment of healthy competition as they strive to outdo one another in order to get recognition. Reward mechanisms can be powerful in getting employees involved in organisational activities (Cummings & Worley, 2009) such as meeting the needs of customers.

With this in mind, organisations must create a customer-responsive culture so as to exceed the minimum expectations of the modern customer. In addition to the above, Robbins and Coulter (2013) suggested strategies that strengthen customer-responsive cultures, namely hiring the right employees, creating the right job environment, empowering employees, providing role clarity, and fostering the consistent desire to satisfy and delight customers. The managerial implications of each of these strategies are indicated in table 2.4 below:

Table 2.4: Characteristics of customer-responsive cultures

Characteristics of customer-responsive culture	Suggestions for managers
Type of employee	Hire people with personalities and attitudes consistent with customer service: friendly, attentive, enthusiastic, patient, good listening skills
Type of job environment	Design jobs so employees have as much control as possible in satisfying customers, without rigid rules and procedures
Empowerment	Give service-contact employees the discretion to make day-to-day decisions on job-related activities
Role clarity	Reduce uncertainty about what service-contact employees can and cannot do by providing continual training on product knowledge, listening and other behavioural skills
Consistent desire to satisfy and delight customers	Clarify organisation's commitment to doing whatever it takes, even if it falls outside an employee's normal job requirements

Source: Robbins and Coulter (2013)

2.11.3 Workplace spirituality and organisational culture

Workplace spirituality is a form of organisational culture in which the values of an organisation promote a sense of purpose through meaningful work taking place in the context of a community (Robbins & Coulter, 2013). Afsar and Rehman (2015) concur by arguing that workplace spirituality recognises that individuals are driven by an inner life which gives meaning to work and a sense of completeness and joy in the realm of a community. The inner life component of workplace spirituality means that people's

hearts also need to be connected with the workplace. In light of this, Petchsawang and Duchon's (2009) argument comes as no surprise, namely that people find meaning and purpose and are able to fully express themselves in the workplace when their hearts are involved in their work.

Workplace spirituality is enhanced through creating family-like dynamics and a greater sense of community at work, and providing meaningful work and feedback to employees (Afsar & Rehman, 2015). A greater sense of community results in a stronger connection of different stakeholders at the workplace (Daniel, 2015). This can strengthen interpersonal bonds amongst people at the workplace, as well as generate diverse viewpoints and a high degree of knowledge sharing. In turn, knowledge sharing enhances creativity as employees support one another's ideas.

When managers provide feedback, employees become aware not only of the results of their work efforts, but also of organisational values. This enhances the level of connection between the employees and the organisation, which, in turn, develops a sense of a devotion to the organisation. Feedback also enhances inclusivity; hence employees feel attached to one another and perceive themselves as part of a community (Daniel, 2015).

Workplace spirituality is also driven by meaningful work. Meaningful work is the experience that a work assignment is significant and important to the employee (Daniel, 2015). According to Afsar and Rehman (2015), meaningful work motivates employees to accept challenging goals and make positive changes at the workplace. Similarly, Daniel (2015) argued that highly challenging organisational goals exert pressure on employees to use their skills, abilities and experience. This creates a sense of joy and energy amongst employees, leading to high levels of intrinsic motivation.

In addition to having a positive impact on individual behaviour in the workplace, workplace spirituality also has a positive impact on groups and the overall organisation (Daniel, 2015). In a study in the hospitality sector, Gatling, Kim and Milliman (2016) established that workplace spirituality is positively related to organisational commitment, but negatively related to the intention to quit. Workplace spirituality furthermore enhances organisational variables such as intrinsic motivation (Afsar, Badir, & Kiani,

2016), innovative work behaviour (Afsar & Rehman, 2015), organisational corporate citizenship behaviour (Petchsawang & Duchon, 2009) and ethics (Pawar, 2009; Petchsawang & Duchon, 2009). This means that managerial leadership has to provide a workplace environment that enhances workplace spirituality.

2.12 Theoretical framework

As indicated before, the CVF served as the theoretical framework for investigating the impact of organisational culture on innovation and knowledge sharing. The CVF has been utilised as a framework for mapping the culture profiles of organisations and conducting comparative analysis (Quinn & Cameron, 1983; Quinn & Kimberly, 1984) in over 10 000 organisations globally (Cameron & Quinn, 2006). Given its rigorous nature, the model was found suitable for application in this investigation. The CVF is visually presented in figure 2.3 below:

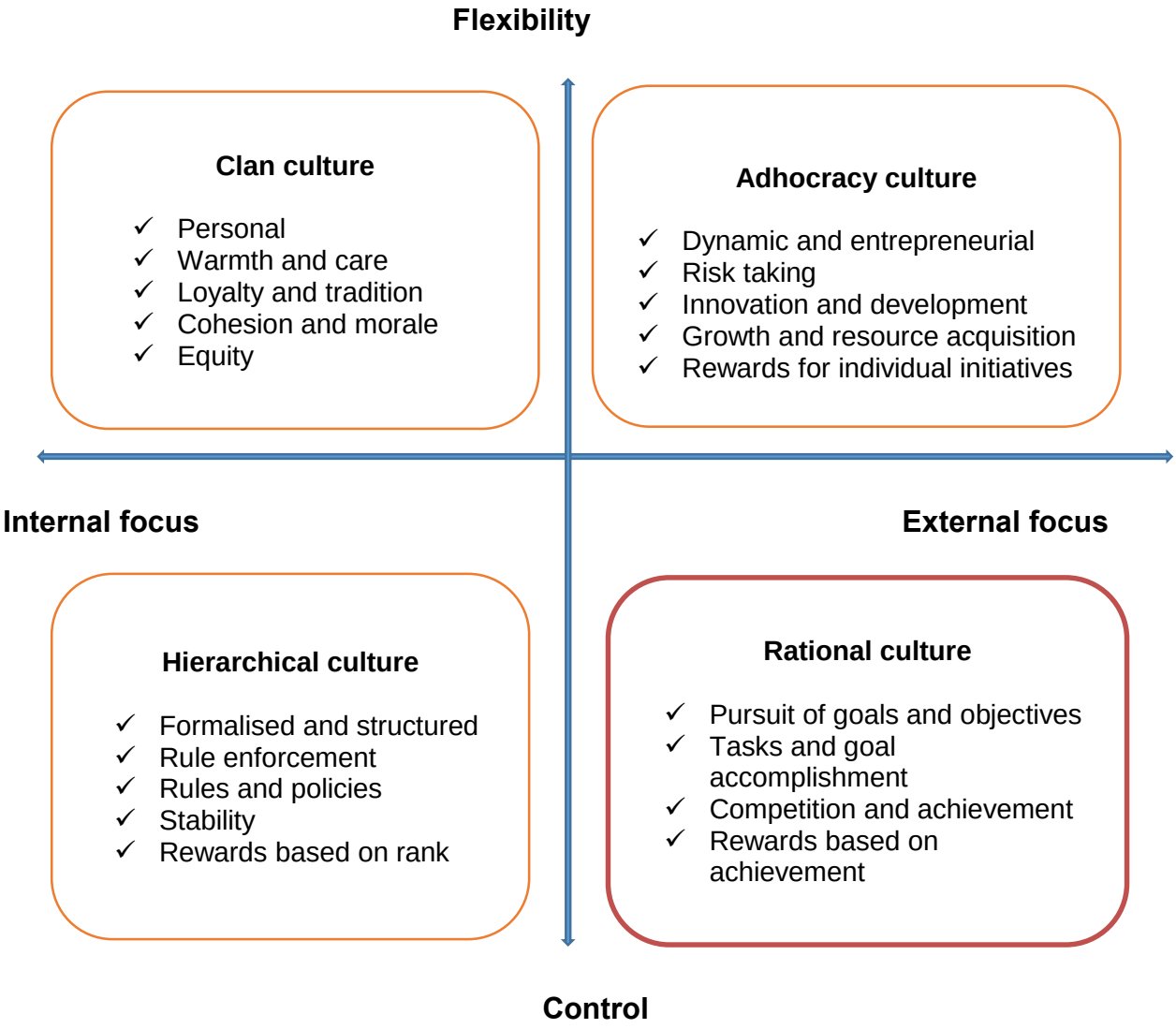


Figure 2.3: The Competing Values Framework

Source: Parker and Bradley (2000)

Figure 2.3 above sets out the CVF based on the work of Quinn and Rohrbaugh (1983). They proposed that organisations have two competing values dimensions. The first dimension differentiates an organisation's internal orientation from an external orientation, whereas the second dimension differentiates between flexibility on the one hand and control on the other (Denison & Spreitzer, 1991). Organisations with an internal focus emphasise information management, communication and integration, whereas organisations with an external focus emphasise growth, resource acquisition and interaction with the external environment (Parker & Bradley, 2000). Organisations with a focus on flexibility emphasise adaptability and spontaneity, whilst organisations

with a focus on control emphasise stability and cohesion (Zammuto, Gifford, & Goodman, 1999).

When the two dimensions are combined, four quadrants, or cultural types, can be distinguished, namely the clan or group culture, the adhocracy or developmental culture, the hierarchical culture and the rational or market culture. Each quadrant is characterised by certain objectives or processes (Kokt & Van der Merwe, 2009). Although most organisations display a dominant culture, Cameron and Quinn (2006) noted that, in more than 80% of organisations, more than one dominant cultural type can be distinguished. The next section gives a brief description of each cultural type.

Clan culture: The clan culture, also known as the group culture, is internally oriented and is reinforced by a flexible organisational culture (Hartnell *et al*., 2011). This cultural type puts the maximum focus on maintaining family-like relationships with others in the group (Cho *et al*., 2013); thus the culture is concerned with human relations, with an emphasis on flexibility and the internal organisation (Denison & Spreitzer, 1991). A core belief of the clan culture is that the organisation's trust in and commitment to employees would facilitate open communication and employee involvement (Hartnell *et al*., 2011), developing in employees a sense of belonging to the organisation. As a result, they would put in all effort towards the accomplishment of organisational objectives. Teamwork, participation and consensus are key focus areas (Cameron & Quinn, 2006).

Adhocracy culture: The adhocracy culture, also known as the developmental culture, is externally oriented and is supported by a flexible organisational structure (Hartnell *et al*., 2011). A fundamental belief of this culture is that it fosters organisational change. Organisations seeking to adapt to the ever-changing external environment have to cultivate this cultural type. An organisation with a predominantly developmental culture is a dynamic, entrepreneurial place to work. Employees take risks, and the leaders are innovators and risk-takers themselves. Commitment to experimentation and innovation defines this organisation. The long-term emphasis of the organisation is on growth and the acquisition of resources. Success is defined in terms of unique products and service offerings, and being a product or service leader is important. Individual initiative and freedom are key focus areas (Cameron & Quinn, 2006).

Hierarchical culture: The hierarchical culture is internally oriented and is supported by an organisational culture that is driven by control mechanisms (Hartnell *et al*., 2011). Employees meet expectations when goals are clearly defined. This cultural type represents a formal organisation and bureaucracy, along with an emphasis on documenting, measuring and managing information. The main focus areas are monitoring and coordinating (Lindquist & Marcy, 2016).

Rational culture: The rational, or market, culture is externally oriented and is reinforced by an organisational structure steeped in control mechanisms (Hartnell *et al*., 2011). This type of culture focuses on performance and profit or goal maximisation or cost minimisation, with emphasis on directing, implementation and productivity (Lindquist & Marcy, 2016). A core belief of this culture is that clear goals and contingent rewards would motivate employees to aggressively perform and meet stakeholders' expectations (Hartnell *et al*., 2011).

The CVF provides an integrated and consistent approach to individual and organisational development and improvement (Cameron, 2009). The approach suggests a culture orientation, value drivers, leadership competencies and the strategies to achieve effectiveness (Cameron, 2009) associated in each quadrant, as shown below:

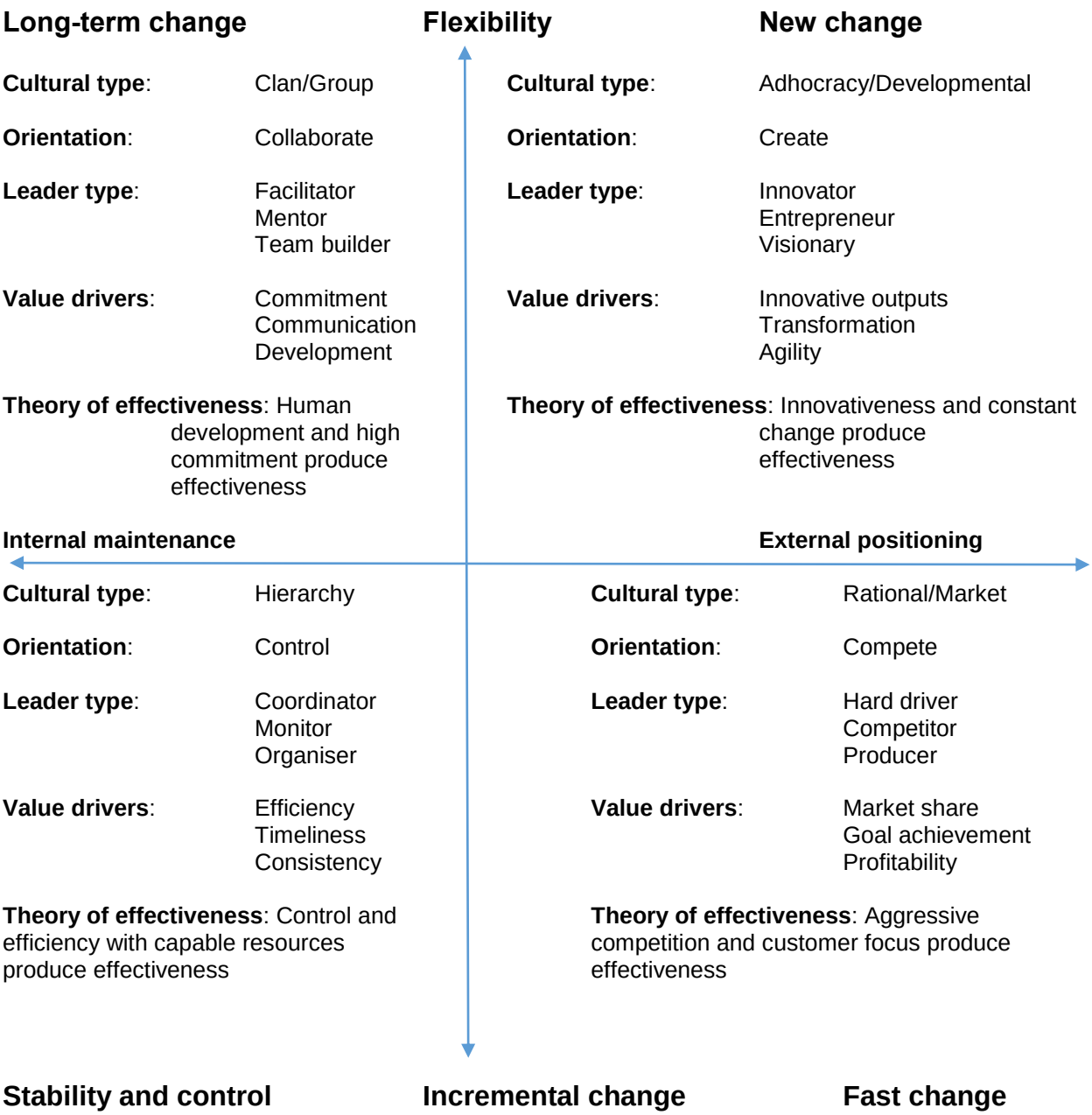


Figure 2.4: The Competing Values Framework for leadership, effectiveness and value drivers
Source: Cameron (2009)

Figure 2.4 above sets out the cultural type of each quadrant, with the organisational orientation and leader competencies required to be successful for each cultural type, as well as the associated value drivers. Each variable is explained in a separate paragraph below.

In the clan/group cultural type the general organisational orientation is towards collaboration. Leadership competencies required to be successful include being a

facilitator, mentor and team builder. The organisation is driven by values that emphasise employee development and gaining employee commitment in the process. When the skills of employees are developed and there is a sense of employee commitment, an organisation can achieve its set objectives.

In an adhocracy/developmental culture the general organisational orientation is towards creativity, with leadership competencies such as being an innovator and having entrepreneurial skills important for survival and success. Agility and transformation are central value drivers, as the organisation has to quickly adapt to the dictates of the external environment to stay ahead of competitors. The organisation achieves its objectives through innovation, constant adaptation and crafting an appropriate vision.

In a hierarchical culture business orientation is control, with leadership competencies such as being a coordinator, monitor and organiser crucial for success. The value drivers in this culture are timeliness, consistency and uniformity. The organisation achieves its objectives by implementing processes that result in efficiency and effectiveness.

In a rational or market culture, the general organisational orientation is competitiveness. Leadership competencies required for success include being a hard driver and a competitor. The organisation is driven by the desire to make profit, attain high market share and achieve goals. Strategies such as aggressive marketing and a customer focus are used to reach objectives.

2.13 Summary

From the literature review in this chapter, ‘organisational culture’ can be defined shortly as basic shared values, symbols, beliefs, artefacts and assumptions to which members of an organisation ascribe.

The chapter also explained the characteristics of organisational culture, the levels of organisational culture, the distinction between industry and national culture, and the distinction between organisational culture and organisational climate. Organisational culture has become high priority for managers in recent years. Therefore, the

contemporary issues in organisational culture confronting management were set out. Lastly, the applicability of the CVF was discussed by providing the rationale for using this framework as a theoretical guide for this study.

CHAPTER 3: INNOVATION AND KNOWLEDGE SHARING IN A UNIVERSITY CONTEXT

3.1 Introduction

Given the wave of digitalisation that is rapidly altering economies around the world, innovation and knowledge sharing have become more important than ever before (Cirera & Maloney, 2017). Due to increased digitalisation and virtualisation, the world of work has radically shifted, and change is occurring at breath-taking speeds. This has not only affected organisations, but also societies and the ways in which people interact (Deloitte, 2017).

In response to the ever-changing external environment, contemporary organisations are building collaborative and innovative cultures (McDowell *et al.*, 2016). Corporate leadership can no longer afford to operate according to old paradigms and should embrace new ways of thinking in order to stay competitive. Innovation and knowledge sharing have therefore become a top priority for managers. In fact, innovation is viewed as the critical ingredient of how organisations and industries can achieve prosperity today (Cirera & Maloney, 2017). In a study of more than 500 executives, conducted by Accenture Plc in the USA, approximately 67% of respondents claimed that they depend strongly on innovation for their long-term success (Kuratko, Covin, & Hornsby, 2014). This is because innovation is associated with the development of new ideas to improve products and services.

On the other hand, knowledge sharing is considered a key driving force for the maximisation of operational benefits (Chen *et al*., 2014) as well as competitiveness (Navimipour & Charband, 2016). This can be attributed to the fact that knowledge sharing allows the integration of experts' knowledge, critical skills and abilities to address complex organisational issues. Moreover, knowledge sharing is closely related to the concept of innovation, with knowledge being considered a key building block for innovation (Kamaşak & Bulutlar, 2010). The interaction amongst groups and teams improves their capacity to define challenges and devise solutions, which, in turn, improves creativity. Kamaşak and Bulutlar (2010) further argue that, when knowledge is transferred amongst groups within organisations, existing ideas from one group

appear novel to another, and vice versa, resulting in potentially new products or services.

Universities play a central role in enhancing innovation and knowledge sharing. This is because universities are knowledge-intensive environments whose core role is to create knowledge through research and disseminate knowledge through publications and interaction with stakeholders (Fullwood *et al*., 2013). Furthermore, universities support innovation when their research knowledge is transferred to industry in the form of new products and services.

This chapter explains the concepts of 'innovation' and 'knowledge sharing' and provides a theoretical grounding for investigating the two concepts. The chapter also investigates the factors that enhance innovation and knowledge sharing and the models that were used as conceptual guides to develop the questionnaire for the empirical part of the study.

3.2 Explaining innovation

According to Henrike (2014), 'innovation' is defined as the intentional introduction and application of new ideas, processes, products or procedures that are designed to significantly benefit a group or organisation. Similarly, Gault (2018) defines innovation as the implementation of a new or significantly improved product (either goods or services), process, marketing method, or organisational method in business practices, workplace organisation or external relations. Innovation therefore aims to improve organisational product offerings and services to achieve organisational objectives.

Other researchers such as Kuratko *et al.* (2014) view innovation as the process of making changes – large and small, radical and incremental – to products, processes and services. These changes introduce something new in the organisation which adds value to customers and contributes to the knowledge store of the organisation. With regard to the nation at large, Crossan and Apaydin (2010) describe innovation as the production or adoption, assimilation and exploitation of a value-added novelty in economic and social spheres; the renewal and enlargement of products, services and

markets; the development of new methods of production; and the establishment of new management systems.

For the purpose of this study, Cirera and Maloney's (2017) definition of innovation was adopted because it incorporates the views of other researchers as indicated above. Cirera and Maloney (2017) define innovation as the introduction of new products, technologies, business processes and ideas in the market, as well as the invention of new ideas. An important observation from the definitions above is that innovation is associated with novelty in production, marketing and service spheres. Organisational novelty ensures enhanced managerial practices, organisational processes and business models. This results in productivity growth and the likelihood of competitive edge over rivals. In light of the above, the following section discusses the theoretical foundation of the innovation construct.

3.3 Theoretical perspectives on innovation

There are several theoretical approaches from which to investigate the innovation construct (see Crossan & Apaydin, 2010; George, Mcgahan, & Prabhu, 2012). Due to the nature of this study, with its focus on innovation practices in a university environment, the Dynamic Capabilities Approach (Teece & Pisano, 1994) was found to be the most appropriate theoretical approach as it provides powerful insights into how innovations are built in a university context.

3.3 1 Dynamic Capabilities Approach

The Dynamic Capabilities Approach was proposed by Teece and Pisano (1994). According to Teece (2017), 'dynamic capability' refers to the ability of an organisation to integrate, build and reconfigure internal and external competencies to address rapidly changing environments. In support of this, Froehlich, Cristina and Bonzanini (2017) view dynamic capabilities as organisational competencies that facilitate the creation of competitive advantages in a rapidly changing environment. This approach is therefore a suitable theoretical underpinning for research in innovation-driven environments such as universities. The adoption of the Dynamic Capabilities Approach as a theoretical framework in innovation research is consistent with views of authors such as Kindström,

Kowalkowski and Sandberg (2013), Froehlich *et al.* (2017), Breznik and Hisrich (2014), and Pundziene and Teece (2016).

According to Teece (2017), dynamic capabilities are important in three areas, namely sensing opportunities and threats, seizing the opportunities, and transforming and reconfiguring business models to maintain advantage over rivals. The three areas are explained below.

Sensing capabilities: This concept refers to the gathering of relevant marketing intelligence information (Kindström *et al.*, 2013). Organisations that are pursuing competitive advantage should be able to scan global and local markets, assess customers' actual preferences, and capture ideas internally from a wide range of employees. This will enable an organisation to craft solutions that can delight the customer.

In the university context, sensing capabilities may involve the ability of the university to gather information regarding potential collaboration and networking opportunities with industry and other research organisations. University–industry interaction is critical in building technological capability through the learning process. As people interact they learn from one another by sharing ideas which are critical in enhancing innovation. It is not surprising that Kruss, Mcgrath, Petersen and Gastrow (2015) have identified learning as a source of dynamic capabilities.

Seizing opportunities: Seizing opportunities involves designing a business model that is capable of sustaining and exploiting new opportunities in the external environment (Kindström *et al.*, 2013). The key element here is that the organisation be responsive to the dictates of the external environment and act on them. In the exploitation of opportunities, an organisation should be able to pool resources together and devise plans to benefit maximally.

In a university context, seizing opportunities may involve the creation of infrastructure to exploit gaps in the external environment such as opportunities to create companies and to invent and market cutting-edge technologies. Universities may exploit opportunities in the external environment through establishing infrastructure such as science parks,

technology transfer offices (TTOs), incubation hubs and entrepreneurship centres. Such infrastructure facilitates the creation and marketing of university innovations.

Reconfiguration of capabilities: Reconfiguration of capabilities involves realigning the capabilities of the organisation with the ever-changing environment. As mentioned previously, agility is an important value driver in an ever-changing environment. As the environment changes, so should the organisation. To do so, the firm must reconfigure fundamental elements of its business model and its current resources in order to remain relevant in the market (Kindström *et al*., 2013).

In the university context, capability reconfiguration may involve the repositioning of university resources to facilitate the sensing and seizing of opportunities in the environment. This may involve such strategies as increasing research and development expenditure, changing university culture and structure, and introducing new policies and procedures. The adoption of these strategies can reinvigorate the effectiveness of a university with regard to innovation.

3.3.2 Dynamic capabilities and innovation

Dynamic capabilities and innovation are interlinked. This study posits that sources of dynamic capabilities also trigger innovation in an organisation. The dynamic capabilities to sense and seize opportunities, as well as to reconfigure the organisation, originate from factors such as organisational culture, managerial competencies, organisational processes, routines, procedures, and organisational structure (Kindström *et al.*, 2013; Teece, 2017). These factors also influence innovation at the workplace.

In earlier studies, Teece, Pisano and Shuen (1997) and Teece (2012) identified learning, endowment of technology, access to special equipment and facilities, cross-functional research and development teams, technology transfer routines and creative managerial and entrepreneurial acts as critical dynamic capabilities. These dynamic capabilities can also be critical determinants of innovation at the workplace.

Dynamic capabilities are firm specific (Breznik & Hisrich, 2014). They are heterogeneous across firms because of their unique positions, specific paths and

processes (Teece *et al.*, 1997); hence they are difficult to replicate (Teece & Pisano, 1994). The same can be said of innovation: Innovation can be designed to meet specific needs, it is unique to a particular organisation and is thus also difficult to replicate.

The relationship between dynamic capabilities and innovation as explained above substantiate the adoption of the Dynamic Capabilities Approach as a theoretical underpinning for the innovation component of this study.

3.4 Types of innovation

Innovation can be classified in terms of product innovation, process innovation, marketing innovation and organisational innovation. Each will be discussed below.

Product innovation: Product innovation entails the introduction of a good or a service that is new or significantly improved with respect to its characteristics or intended use (Cirera & Maloney, 2017). According to Kuratko *et al.* (2014), product innovation is about making beneficial changes to physical products. These beneficial changes can include the improvement of specifications, components/materials, incorporated software and the user-friendliness of a product. Three metrics used in product innovation are new products to the firm, new products to the market and new products to the international market.

Process innovation: Process innovation is the implementation of a new or significantly improved production or delivery method, for example, changes in techniques, equipment or software (Cirera & Maloney, 2017). Kuratko *et al*. (2014) concur by suggesting that process innovation is about making beneficial changes to the processes that produce products or services. Process innovation includes innovative methods for manufacturing products or services, innovative logistics or distribution methods, and innovative supporting activities in the areas of accounting, auditing and purchasing.

Marketing innovation: Marketing innovation is the implementation of a new marketing method which brings significant changes to some of the marketing mix elements such as product design, packaging, product placement, promotion or pricing (Cirera & Maloney, 2017).

Organisational innovation: Organisational innovation is the implementation of new organisational methods in business practices. It includes structural innovation and procedural innovation (Cirera & Maloney, 2017). Structural innovation has an impact on responsibilities, accountability, command lines and the number of hierarchical levels. An innovative change in these variables may increase the effectiveness of the enterprise. Procedural innovation encompasses changes to the routines, processes and operations of the enterprise.

The types of innovation discussed above can be differentiated according to the trajectory they may take, namely radical, incremental or disruptive. These trajectories will be discussed below.

Radical innovation: Radical innovation entails changes on such a scale that the organisation itself is transformed by changing the existing market (Kuratko *et al*., 2014). Radical innovation can destroy or supplant an existing business model.

Incremental innovation: Incremental innovation is the systematic evolution of a product or service into newer or larger markets (Kuratko *et al.*, 2014). Examples are typical improvements and advances in current products and services. The structure, marketing, financing and formal systems of a corporation can assist in implementing incremental innovation.

Disruptive innovation: Disruptive innovation occurs when established competitors are displaced by technological applications that were initially introduced at the bottom of the market, but relentlessly made their way to the top. Disruptive innovation often occurs because new sciences and technologies are introduced or applied to a new market with the potential to exceed the existing limits of technology (Kuratko *et al*., 2014). Disruptive technology goes beyond radical innovation: it transforms business practice and rewrites the rules of an industry.

3.5 Drivers of innovation

The aspects discussed below can be regarded as drivers of innovation. They include research and development, management quality, knowledge management, purchase of new equipment, managerial practices, business environment and organisational culture.

Research and development: Research and development (R&D) encompasses obtaining new knowledge to be used to create new technology, products, services and systems. R&D is one of the most commonly discussed sources of input in the innovation process (Cirera & Maloney, 2017). Globalisation and its attendant consequences, such as fierce competition and technological changes, have forced governments and institutions to prioritise R&D. Innovation emerging from the R&D process allows institutions to stay ahead of competition. Thus, to benefit from R&D, countries and institutions should set aside significant finance for that purpose.

Management quality: Management quality refers to the managerial talent available in an organisation. According to Bloom and Van Reenen (2007, 2010), human capital and ownership structure affect management quality. Management must possess basic organisational skills and the logistical abilities to plan work. The talent available in an organisation should be able to identify new opportunities and devise viable plans to exploit opportunities for the benefit of the organisation (Cirera & Maloney, 2017).

Organisations that invest in on-the-job training and have educated and experienced employees tend to score highly on management quality (Cirera & Maloney, 2017). This shows the importance of knowledge acquisition in managerial practices. Management quality is therefore driven by investment in human capital through both learning and work experience. Researchers such as Bloom and Van Reenen (2010) and Maloney and Sarrias (2017) concluded that ownership structure is significantly associated with management quality. They posit that government-owned enterprises are badly managed as compared to privately owned companies. Government-owned enterprises in general may fail to hire highly skilled and experienced professionals, which can limit the learning and upgrading of business processes required for innovation. It can therefore be inferred that innovation levels are high in privately owned organisations as compared to government-owned businesses.

Knowledge management: Knowledge management is the process of capturing, sharing, developing and using knowledge efficiently (Navimipour & Charband, 2016). Two important aspects under this definition of knowledge management are knowledge creation (development) and knowledge sharing. Knowledge creation is a key enabler of innovative practices. Knowledge creation is concerned with the continuous process of learning by acquiring a new context, a new view of the world and new knowledge in overcoming individual boundaries (Kamaşak & Bulutlar, 2010). The development of new knowledge influences innovations, and the human capital component is critical in the process of creating knowledge. In most cases knowledge is created through research at universities and other research centres. Knowledge creation and sharing improve the way people define a situation and solve organisational challenges creatively. The collaborative behaviour amongst individuals enhances the degree of novelty in organisations as people offer diverse views to confront organisational challenges.

Purchasing of new equipment: The purchase of new equipment is a form of new knowledge absorption (Cirera & Maloney, 2017). When new equipment comes into an organisation it means the organisation has imported knew knowledge to be used in production processes. New equipment enhances the productive capacity of an organisation and makes employees knowledgeable about improved methods of conducting business.

Managerial practices: Managerial practices are the different operational mechanisms initiated and implemented by management in an organisation. Managers play an important role in enhancing innovative practices in a variety of ways. According to Bell and Figueiredo (2012), managers can enhance innovation by creating dedicated departments for innovation, such as design and engineering departments, and quality circles. These departments can focus solely on enhancing organisational processes. Furthermore, Garicano and Rossi-Hansberg (2015) suggest that teamwork is important for innovation. Working in teams affords experts adequate time for innovations, and team-based structures provide excellent platforms for sharing ideas.

Performance reward systems have a positive influence on creativity and innovative behaviour of individual employees (Ederer & Manso, 2013; Gibbs, Neckermann, & Siemroth, 2015). These systems motivate employees by rewarding them for undertaking

sophisticated innovations. Risk taking at the workplace should therefore be encouraged to energise employees' creativity. Workers should be allowed to propose improvements and not be penalised for making mistakes. Those who come up with game-changing initiatives have to be rewarded accordingly.

Business environment: The business environment encompasses the internal and external variables that can have an impact on the operations of an organisation. These factors influence the rate of innovation undertaken by an organisation. Business competition, for example, plays an important role either by forcing the worst firms to exit or by stimulating the industry to work harder in order to survive competition (Bloom & Van Reenen, 2007, 2010). Competition in the industry can stimulate efforts amongst firms to upgrade technology and other business activities. In this regard, Bloom, Draca and Van Reenen (2016) noted that a greater number of European Union firms have upgraded their technology and financed more R&D after facing competition from Chinese products.

Organisational culture: Organisational culture is considered a key stimulant of innovation (see Efrat, 2014; Glisson, 2015; Khazanchi, Lewis, & Boyer, 2007; Naranjo *et al*., 2015, 2017). Because organisational culture influences employee behaviour, employees may accept innovation as a fundamental value in the organisation (Naranjo *et al*., 2015).

From the synthesis of literature above, a framework of factors that enhance innovation is proposed in figure 3.1 below:

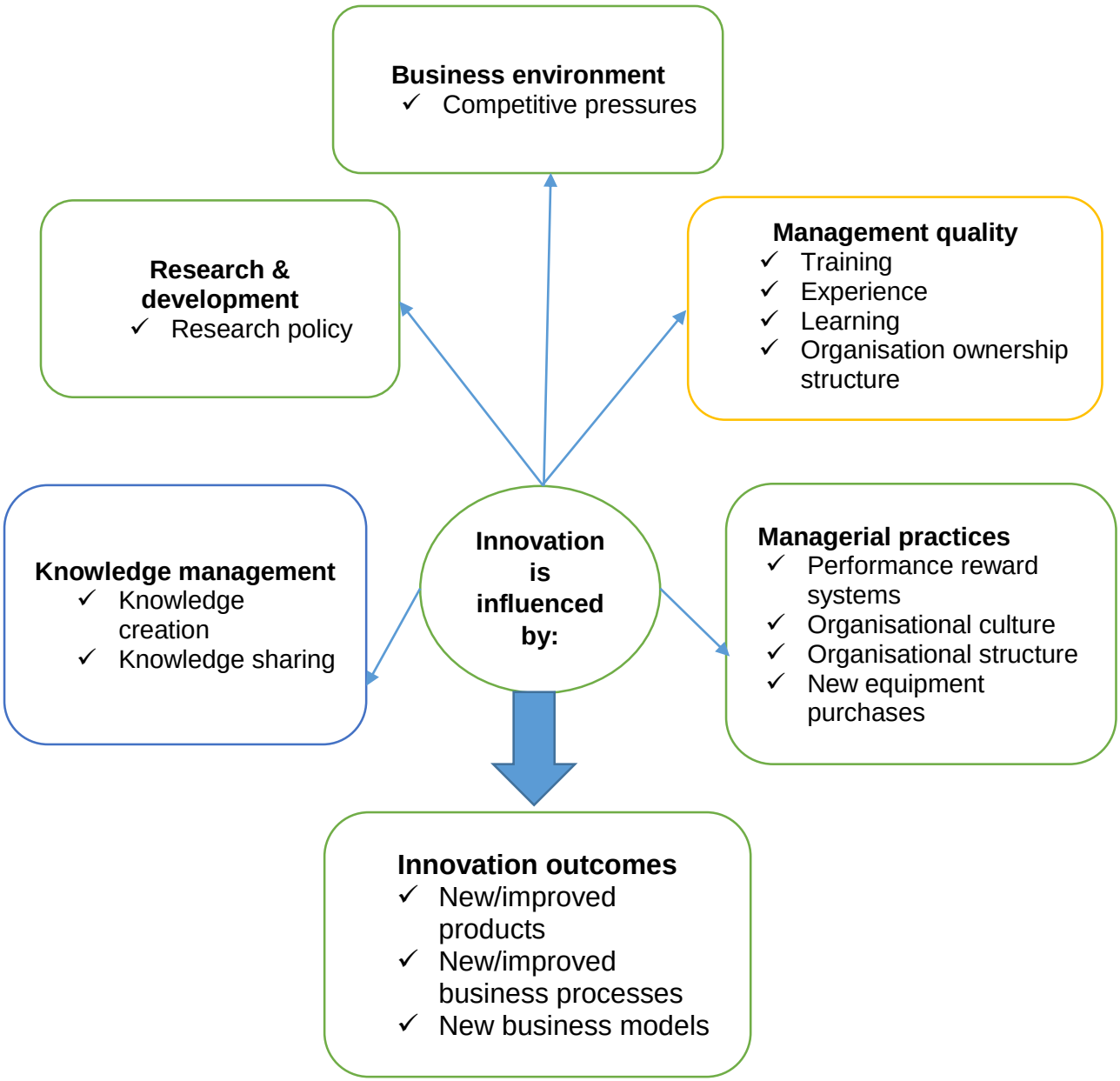


Figure 3.1: A framework of factors that influence innovation
Source: Researcher's own illustration from literature

From figure 3.1 it is clear that innovation is influenced by knowledge management, managerial practices, the business environment, R&D and management quality. These elements result in the creation of novel practices in an organisation.

3.6 The role of universities in fostering innovation

The role of universities in fostering innovation is best explained by the Triple Helix model of innovation (Etzkowitz, 2008). The Triple Helix is a robust model that is used to understand the role of the university (academia), industry and government (state) in advancing innovation (Cai & Liu, 2015). The trilateral interaction amongst university, industry and government enhances the performance of each of these sectors. The argument put forth is that, when these three players work independently of each other, it becomes difficult to advance the innovation agenda.

The interaction of the university, government and industry leads to the generation of hybrid organisations such as TTOs in universities, new firms, government research labs and financial support institutions (Etzkowitz, 2008). These hybrid organisations play a prominent role in advancing innovation. A pictorial presentation of the government, university and industry relationship is shown in figure 3.2 below:

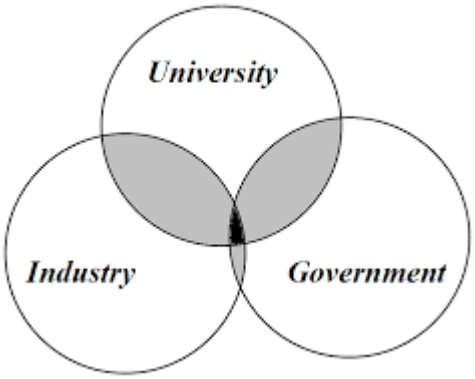


Figure 3.2: Triple Helix model
Source: Etzkowitz (2008)

As seen in figure 3.2, the core idea of the Triple Helix model is that academia should be closely linked with business and industry. The research output of universities should be applied to solve the challenges in business and industry, hence contribute to the development of the knowledge economy (Cai & Liu, 2015). Business and industry can be seen as a source of research challenges for universities, and it is the duty of the universities to provide research knowledge to solve industry challenges. By promoting knowledge transfer to business and industry, universities enhance innovation in the

economy. On the other hand, government is responsible for creating favourable conditions for academia and industry to prosper.

In the triple helix interaction universities advance the innovation agenda through university structural design, organisational culture, entrepreneurship education, university strategic visions, and commercialising research knowledge. These mechanisms are discussed below.

University structural design: University structural design involves the creation of formal organisational mechanisms for knowledge exchange at universities. Nelles and Vorley (2011) argue that universities promote innovation by establishing structures that support innovation. These structures allow faculty administrators, students, and externals an opportunity to exchange ideas that promote research. Technology parks, industrial liaison offices, science parks and TTOs are some of the structural mechanisms that can be used by universities to promote innovation (Kirby, Guerrero, & Urbano, 2011). Technology transfer offices market commercialised research technology to the outside world for the benefit of the researchers.

Organisational culture: In a university setting, the organisational culture is concerned with the collective values directed towards innovation by university members (Nelles & Vorley, 2011). Organisational culture is therefore a key ingredient in innovation practices (Büschgens *et al.*, 2013; Sarooghi *et al.*, 2015) in universities. Universities have to create and sustain a cultural type that support innovation. This can include developing artefacts for innovation, rewarding commercialised research and promoting idea champions at universities.

Entrepreneurship education: Entrepreneurship education refers to the teaching and promotion of entrepreneurship in universities (Kirby *et al.*, 2011). This helps to create an entrepreneurial ethos and positive attitude towards entrepreneurship amongst administrators, faculty members and students (Etzkowitz, 2008). An entrepreneurial culture is key in the innovation process because it emphasises creativity, the capability to seek opportunities, and the courage to take risks. All these variables promote change. University management can also offer rewards to build mind-sets that are geared towards entrepreneurship.

University strategic vision: A university's strategic vision clarifies the long-term objective of the institution. The university leadership can promote innovation by formulating and implementing visions directed at advancing the innovation agenda (Etzkowitz, 2008). The strategic direction can focus on creating structures, systems and strategies that promote innovation (Nelles & Vorley, 2011). In turn, strategies can focus on recruiting members with a strong resolve for the innovation agenda, formulating a reward structure to incentivise commercialised research and establishing funding mechanisms to undertake R&D.

Commercialising of research knowledge: Research commercialisation refers to the process through which ideas or research are transformed into marketable products. Universities can capitalise the knowledge they generate (Etzkowitz, 2008) by creating intellectual property. The creation of intellectual property changes the way academics view their research results and improves the degree of knowledge transfer to the industry.

3.7 Innovation in developing countries

According to Cirera and Maloney (2017), developing countries are less innovative than developed countries despite the huge quantum of resources at their disposal. This has been termed the **innovation paradox**. Zimbabwe is a good example of a country with low levels of innovation despite the vast pool of natural and human resource talent available in the country. As indicated before, the country is ranked 113 out of 126 countries on the innovation output index (Dutta *et al.*, 2018). The same authors assert that the governments of developing countries appear to be leaving billions of dollars of potential business untapped largely because of the slow rate of technology adoption in these countries. The table below shows the global innovation index ranking of selected countries:

Table 3.1: Global innovation index ranking

Country	Rank/126
Switzerland	1
Netherlands	2
Sweden	3
United Kingdom	4
Singapore	5
Zimbabwe	**113**
Benin	121
Niger	122
Ivory Coast	123
Burkina Faso	124
Togo	125
Yemen	126

Source: Dutta *et al.* (2018)

From table 3.1 above it is clear that developed countries (1–5) are highly ranked in terms of innovation, whereas developing countries occupy the bottom positions (121–126). Cirera and Maloney (2017) suggest reasons for low innovation in developing countries as follows:

- Mechanisms for science–industry exchange are weak. This results in a limited flow of information amongst science institutions and industry.
- There is low research capacity in universities and an absence of university–industry linkage collaboration, with Zimbabwe ranked 116 out of 126 countries on the university–industry collaboration linkage index (Dutta *et al*., 2018). This means there is little commercialisation of research, which limits knowledge transfer. The cross-pollination of ideas between industry and academia is therefore lacking or non-existent.
- There is a low prevalence of technological management and productive capabilities. Developing countries lack the skills to create and improve technologies. Zimbabwe is ranked 83 out of 126 on the knowledge transfer and technology outputs index, and 68 out of 126 on the knowledge creation index (Dutta *et al*., 2018).
- There is a lack of technological literacy. This is largely because foreign direct investment is low and investments are largely extractive. This means that technology from developed countries is not imported into the developing world,

with Zimbabwe ranked 118 out of 126 with regard to ICT services imports (Dutta *et al*., 2018).

- The large rate of business informality hinders the adoption of technology and innovation. Most small to medium enterprises use manual methods of operations and do not modernise their operations.

In light of the above, innovation work is largely seen through the lens of the developed country. This has translated to literature on innovation which is quite ubiquitous in developed countries as compared to developing countries (Cirera & Maloney, 2017). The current study was therefore an attempt to provide empirical and theoretical information about innovation and knowledge sharing from a developing country perspective.

3.8 Knowledge sharing

According to Zareie and Navimipour (2016), organisational competitiveness derives mostly from intangible rather than tangible resources. Knowledge, as an intangible resource, is one of the most important resources of an organisation and can influence novel organisational outcomes such as innovation (Kamaşak & Bulutlar, 2010).

There are two types of knowledge: tacit and explicit knowledge. Tacit knowledge exists in the minds of people and consists of the know-how and skills that individuals have acquired overtime (Razmerita, Kirchner, & Nielsen, 2016). Explicit knowledge refers to knowledge that is written down in manuals or other material to be shared with other people (Razmerita *et al*., 2016). For the organisation to benefit from tacit and explicit knowledge, there has to be interaction and collaboration amongst employees; hence knowledge sharing is a crucial variable in organisations (Saenz, Aramburu, & Rivera, 2009).

According to Razmerita *et al.* (2016), knowledge sharing is the process by which employees mutually exchange their tacit and explicit knowledge in order to create new knowledge. Schwartz (2006) concurs by defining knowledge sharing as the exchange of knowledge amongst individuals, and within and amongst teams, organisational units and organisations. These two definitions correspond with the view of other researchers

such as Pulakos, Dorsey and Borman (2003), namely that knowledge sharing is the provision of task information and know-how in collaboration with others to solve problems, develop new ideas, or implement policies or procedures. From these definitions it can be noted that knowledge sharing involves the cross-pollination of ideas and information amongst different organisational actors. Idea and knowledge sharing helps in the improvement of organisational processes.

3.8.1 Theoretical perspectives of knowledge sharing

A number of studies have used different theories to conceptualise the knowledge sharing construct. These theories include the theory of planned behaviour which proposes that individuals' behavioural intention is shaped by their attitude towards behaviour, subjective norms, and perceived behavioural control (see Chatzoglou & Vraimaki, 2009; Razak, Pangil, Zin, Yunus, & Asnawi, 2016; Witherspoon, Bergner, Cockrell, & Stone, 2013). Other theories are the theory of reasoned action, which explains the link between attitudes and behaviour (see Razak *et al*., 2016); self-determination theory, which proposes that people prefer to feel they have control over their actions (see Razmerita *et al*., 2016); and self-efficacy theory, which suggests that motivation is influenced by the belief of individuals that they are capable of performing a task (see Witherspoon *et al*., 2013).

In this study the theory of planned behaviour and the self-efficacy theory were applied to conceptualise the knowledge-sharing construct and operationalise the measuring instrument. The adoption of two theories was premised on the fact that knowledge sharing is influenced by several factors and that a single theory cannot exhaustively explain the knowledge sharing construct. This study therefore argues that a combination of theories can sufficiently explain this construct.

The theory of planned behaviour postulates that subjective norms, attitudes and behavioural control are critical determinants of knowledge sharing (Bohon, Cotter, Kravitz, Cello, & Fernandez y Garcia, 2016). The fact that this theory includes only three factors that influence individuals' behavioural intentions proves to be a major limitation of the theory. In reality there exist other pertinent factors that influence knowledge-

sharing behaviour. It is for this reason that the theory of self-efficacy was adopted as a complementary theory.

The theory of self-efficacy suggests other factors such as an individual's self-belief and social networks as determinants of knowledge-sharing behaviour in organisations (Bandura, 1994). In line with this, high self-esteem and positive encouragement from peers in social circles can act as motivation to share knowledge.

It is clear from the above that a combination of the theory of planned behaviour and the theory of self-efficacy can explain the knowledge-sharing construct more comprehensively than one theory would have. The next two sections discuss each of these theories in the context of universities.

3.8.2.1 Theory of planned behaviour

The theory of planned behaviour was proposed by Ajzen (1985) following the work on the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The theory suggests that behavioural intention is produced by a combination of subjective norms, attitudes towards behaviour and perceived behavioural control. The three terms are unpacked below.

Subjective norms: Subjective norms refer to the social pressure to perform or not to perform certain behaviours (Chatzoglou & Vraimaki, 2009). This means an individual's behaviour depends on the significant views of a reference group. If important people who are close to an individual disapprove a certain behavioural trait, the individual will stop exhibiting the unwanted behaviour. In the same vein, positive encouragement is critical in predicting behaviour. The support from peers in a knowledge-sharing environment can spur individuals to undertake knowledge-sharing activities. A lack of support will act as an impediment to knowledge sharing. In the university context, the views from fellow academic staff members are pertinent in the knowledge-sharing agenda as they can either encourage or discourage the sharing of knowledge.

Attitudes: Attitudes are an evaluation, feeling or action which is either favourable or unfavourable towards something or someone (Robbins & Judge, 2013) or towards objects, people or events (Robbins & Coulter, 2013). Positive attitudes towards a certain behaviour may increase the likelihood that an individual will display such behaviour.

The intention to share knowledge depends upon the attitude of those who want to share knowledge – in this case university researchers. If their attitude is positive, knowledge sharing is possible. In contrast, a negative attitude will act as an impediment to knowledge sharing.

Attitude to knowledge sharing is also influenced by the perceived benefits the sharer believes will accrue after undertaking knowledge sharing (Witherspoon *et al.*, 2013). The belief that perceived benefits will accrue towards the knowledge sharer increases the likelihood of knowledge sharing. Contemporary university researchers are rewarded for publishing or commercialising research work. This can act as a motivator and help build a positive attitude towards knowledge sharing.

Behavioural control: Behavioural control refers to beliefs about the presence of factors that may facilitate or impede performance of the behaviour (Jolaee *et al.*, 2014). If it is fairly easy to engage in a certain behaviour, an individual can execute desired behaviours. So, a greater degree of behavioural control results in increased actualisation of certain behaviours. In line with this, knowledge sharing depends upon the availability of resources to support activities associated with knowledge sharing. Resources such as technology and other organisational resources are critical for seamless flow of knowledge-sharing activities.

In universities, the existence of infrastructure to share knowledge can enhance knowledge-sharing activities. The establishment of meeting rooms, entrepreneurship centres and science parks can increase the probability of knowledge sharing.

3.8.2.2 Theory of self-efficacy

This theory, proposed by Bandura (1994), suggests that the behaviour of an individual towards a task is determined by self-appraisal. A strong sense of efficacy means that people approach difficult tasks as challenges to be mastered rather than as threats to be avoided (Bandura, 1994). The higher the self-efficacy, the more confident one is in believing in success. This belief fosters intrinsic interest and deep engrossment in activities. It can therefore be reasoned that highly self-efficacious employees are usually proactive and intrinsically motivated to share knowledge (Tangaraja, Mohd Rasdi, Ismail, & Abu Samah, 2015).

Self-efficacy influences an individual's behaviour by affecting their motivational and confidence level when confronted with difficulties (Chen, Chuang, & Chen, 2012). If the person has high self-efficacy, they will be motivated to perform a particular assignment and thus be confident to carry the task to completion. This translates to knowledge sharing in that, if an individual believes that the knowledge they possess is valuable to other people, the propensity to share it will be very high. This improves knowledge-sharing activities in an organisation.

According to Bandura (1994), self-efficacy emanates from mastery experiences, vicarious experiences, social persuasion and emotional states. The four sources are explained below.

Mastery experiences: This concept refers to gaining relevant experience with the task or job (Robbins & Judge, 2013). Successes of the past are likely to build a robust belief in one's personal efficacy. Success in knowledge-sharing activities in the past can act as a motivator to continue one's involvement in the knowledge-sharing process. University researchers who have participated in knowledge sharing in the past are likely to be persuaded to undertake knowledge-sharing activities in future due to the accumulation of sufficient experience in this regard. The implication for university managers is that they should always look for opportunities that promote knowledge sharing amongst employees.

Vicarious experiences: These experiences arise from seeing people similar to oneself succeed (Robbins & Judge, 2013), which raises the belief of individuals that they possess the same capabilities to reach success. Successful participation of peers in knowledge sharing raises the beliefs of individuals that they too can partake in knowledge-sharing activities. Vicarious experiences can be enhanced if university management offer platforms to those who want to share knowledge and offer individual rewards to knowledge sharers. In this way, many people can be engaged in research knowledge sharing.

Social persuasion: Social persuasion is encouragement from peers in an attempt to convince the individual that they possess the competencies required for success (Robbins & Judge, 2013). Peers in an organisation can, through positive feedback, influence the attitude of the individual to undertake knowledge-sharing behaviours. In universities, positive peer evaluation with regard to knowledge sharing can stimulate positive attitudes amongst individuals towards their research work.

Emotional states: This concept refers to either the stress, mood or emotional conditions of an individual (Bandura, 1994). These conditions either raise or reduce the individual's efficacy level. Negative moods and emotions will impact an individual's attitude towards knowledge sharing, in other words, their intentions towards knowledge-sharing activities. Universities can do more to promote positive emotions at the workplace. One way is to provide knowledge-sharing infrastructure and incentivise knowledge sharing.

This study adopted some elements from the two theoretical perspectives to measure the knowledge-sharing construct. These are subjective norms, attitude (Bock *et al.*, 2005), self-efficacy (Bock *et al.*, 2005), and organisational support (Cabrera, Collins, & Salgado, 2006).

3.8.3 Knowledge-sharing drivers in universities

Knowledge sharing in universities is driven by such personal factors as the intentions and attitudes of researchers, personal and professional profile of researchers, knowledge self-efficacy and organisational factors such as organisational culture,

subjective norms, trust, technology, social networks, recognition and the university mission and vision. These factors are explained below.

3.8.3.1 Personal factors

Intentions and attitudes of researchers: Intentions and attitudes refer to individual beliefs about the extent and value of one's knowledge and the positive feelings that result from its sharing (Witherspoon *et al.*, 2013). Attitudes of faculty members play an important role in influencing knowledge sharing (Padilla-Meléndez & Garrido-Moreno, 2012). If individuals have positive attitudes towards knowledge sharing and their own knowledge, they can exhibit high intention towards collaboration with others. The attitude towards sharing information can also be influenced by vicarious experiences, in other words, where people in the same circles as the researcher are successfully engaging in knowledge-sharing activities. As mentioned above, the success of others will build a positive attitude towards knowledge sharing in an individual.

Knowledge-sharing intentions are driven by the extent of the benefits or rewards that a sharer believes will accrue to themselves or others as a result of knowledge sharing (Padilla-Meléndez & Garrido-Moreno, 2012; Witherspoon *et al.*, 2013). These rewards can be intrinsic rewards or extrinsic rewards (Razmerita *et al*., 2016). The belief that there are positive returns associated with knowledge will act as a motivator to get involved in knowledge sharing.

The attitude towards knowledge sharing can also be shaped by the leadership behaviours at faculty or department level in a university. If the department chairperson supports knowledge sharing, departmental members can develop a positive attitude and consequently share their inventions (Padilla-Meléndez & Garrido-Moreno, 2012).

Personal and professional profile: A personal and professional profile relates to the personal characteristics of the researcher. Researchers from certain fields, for example, engineering, molecular biology and biochemistry, were found to be more active in knowledge transfer than researchers from other fields (Padilla-Meléndez & Garrido-Moreno, 2012). Linkages between researchers and research users are also a primary

determinant of knowledge sharing. In line with this, Hoye and Pries (2009) note that repeat commercialisers who have established links with the research users are more likely to be engaged in knowledge-sharing activities. Boardmand and Ponomariov (2009) also identified personal and professional characteristics that determine knowledge sharing with the private sector, namely access to funding, tenure status and institutional affiliations.

Knowledge self-efficacy: Knowledge self-efficacy is the belief that an individual would value his/her knowledge (Tan, 2016). If individuals believe that they possess valuable knowledge, they develop the confidence to share it (Witherspoon *et al*., 2013). Knowledge self-efficacy generates an internal motivational drive to want to collaborate with others in an organisation (Razmerita *et al.*, 2016) because the belief is that the information they possess can have a positive impact on others.

3.8.3.2 Organisational factors

Organisational culture: Organisational culture encompasses values, beliefs and systems that may encourage or impede knowledge creation and sharing within organisations (Razmerita *et al*., 2016). Managerial leadership has to create a cultural orientation with a mix of elements that enhance knowledge sharing in an organisation. According to Witherspoon *et al.* (2013), these elements include communication, and participation in decision making.

Subjective norms: Subjective norms refer to the perception of the extent to which an individual's behaviour is accepted, encouraged and implemented by their circle of influence (Jolaee *et al*., 2014). The perception of people who are considered important by an individual has a great influence on their behaviour. If the perception from the reference group is positive, it can encourage the individual towards knowledge sharing. The opposite is true if the perception of the reference group is negative.

Trust: In the context of this study, trust pertains to the degree of trusting colleagues' knowledge (Jolaee *et al.*, 2014). The degree of trust influences stronger collaborative partnerships and better knowledge sharing (Chen *et al.*, 2014). If employees believe

that the knowledge being shared will benefit them and the whole organisation, they will develop a positive commitment towards knowledge sharing (Jolaee *et al*., 2014).

Technology: Technology relates to the availability of technological resources to facilitate knowledge sharing (Witherspoon *et al*., 2013). Technology should increase knowledge sharing by reducing the organisational barriers to sharing. This is a critical enabler of knowledge sharing and resonates well with the behavioural control aspect of the theory of planned behaviour. Technology makes it easier for researchers to undertake knowledge sharing. Technological resources can include video conferencing, online repositories and data bases.

Social networks: Social networks are the participants' existing social ties (Witherspoon *et al*., 2013). Tangaraja *et al*. (2015) see social networks as the existing strength of social ties amongst knowledge providers and knowledge recipients. Social ties can lead to the development of relationships amongst researchers and users of research knowledge (Padilla-Meléndez & Garrido-Moreno, 2012). Academic and industry scientists, university administrators and entrepreneurs can develop collaborative relationships through social networks. This can lead to an improvement in research output through conjoint research efforts.

Recognition: Recognition is one of the primary motives of university researchers for engaging in knowledge sharing (Padilla-Meléndez & Garrido-Moreno, 2012). University researchers are eager to be recognised in the scientific community. Recognition can be in the form of publication in top-tier journals and presentations at prestigious conferences. Funding facilities, grants and monetary benefits are other forms of recognition sought by researchers.

University vision and mission: A university's vision and mission set out the strategic direction of the institution, which is crucial in enhancing knowledge sharing. This resonates with the view of Kim, Daim and Anderson (2009) who emphasised the role of the university mission in technological transfer and the enhancement of knowledge sharing at universities. Knowledge-sharing activities and mechanisms should therefore be part of the university's strategic plans.

From the discussion above, this study proposes a set of personal and organisational factors that play a prominent role in influencing knowledge sharing. The factors are illustrated in figure 3.3 below:

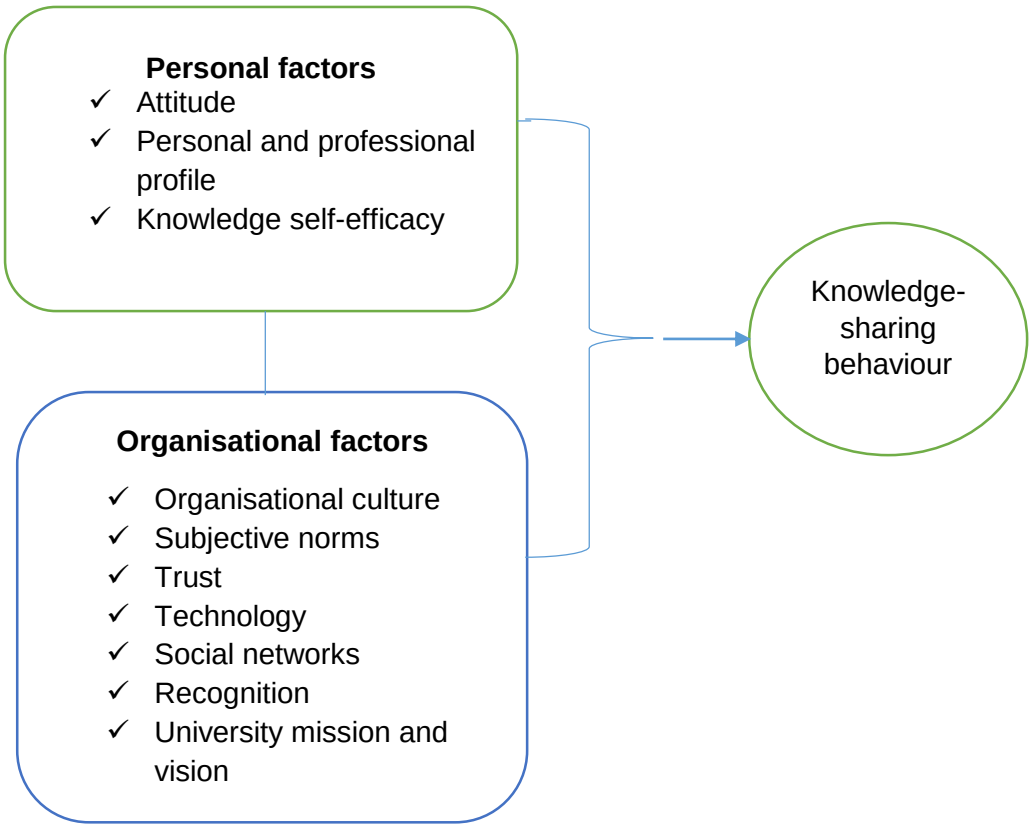


Figure 3.3: A framework of factors that influence knowledge sharing
Source: Researcher's own illustration from literature

Figure 3.3 indicates that knowledge sharing is driven by both organisational and personal factors. Personal factors determine the attitude of an individual towards knowledge sharing, whereas organisational factors create an environment that can either support or impede knowledge sharing.

3.9 Organisational culture and innovation

Organisational culture lies at the heart of organisational innovation (see Glisson, 2015; Hazana, Shamsuddin, Wahab, Aziati, & Hamid, 2014; Markman, 2018; Moonen, 2017; Tian, Deng, Zhang, & Salmador, 2018). Similarly, Büschgens *et al.* (2013) stated that firms that are renowned for their ability to create and commercialise new technologies

frequently emphasise their unique cultures. Furthermore, organisational culture can stimulate innovative behaviour amongst members because it can lead them to accept innovation as a basic value of the organisation (Hartmann, 2006).

Prior research has identified cultural dimensions such as openness and flexibility (Khazanchi *et al.*, 2007; Naranjo *et al.*, 2015); internal communication (Sonnentag & Volmer, 2009); risk-taking (Naranjo *et al.*, 2017); and inter-functional cooperation (Clercq, De Menguc, & Auh, 2009; Swink & Song, 2007) as factors that support innovativeness in organisations. Furthermore, managerial leadership in an organisation can, through activities, policies and procedures, generate values that support creativity and innovation. From the review above, it can be noted that organisational culture plays a critical role in innovation.

3.10 Organisational culture and knowledge sharing

The importance of organisational culture in influencing knowledge sharing is widely recognised (see Howell & Annansingh, 2013; Meléndez & Moreno, 2012; Rahman & Moonesar, 2018; Rega *et al.*, 2014). Past research gives a range of insights into the factors that influence knowledge sharing. Knowledge sharing is enhanced by a culture of trust amongst organisational members, and it has been established that trust helps to alleviate the negative effect of perceived costs on sharing (Witherspoon *et al*., 2013). A culture of cooperative team perceptions has further been identified as an antecedent of trust, a necessary condition for knowledge sharing. On the other hand, an organisational culture that emphasises individual competition may act as a barrier to knowledge sharing, as individuals may want to outcompete one another (Schepers & Van den Berg, 2007).

Another critical factor in knowledge sharing is the attitudes, actions and behaviours of leaders and managers (Fullwood *et al*., 2013). The leadership of an organisation is vital in promoting and cultivating knowledge-sharing behaviour. It also facilitates knowledge sharing by providing opportunities for staff to share or transfer knowledge (Israilidis, Siachou, Cooke, Lock, Israilidis, Siachou, & Lock, 2015). Sandhu *et al.* (2011) observed that managers enhance knowledge sharing by developing appropriate reward systems and opportunities for interaction, and creating time to share knowledge. This view is

shared by Wang and Noe (2010) who found a significant association between organisational culture and knowledge sharing, especially when top management supports the improvement of knowledge-sharing mechanisms.

Technology is also a critical enabler of knowledge sharing in organisations (Panahi, Watson, & Partridge, 2013). Previous research has identified technologies that enhance knowledge sharing in organisations such as email (Hwang & Kim, 2007); world-wide web (Razmerita, Kirchner, & Sudzina, 2009); database management technologies (Panahi *et al.*, 2013); video conferencing (Klitmøller & Lauring, 2013); digital repositories (Theriou, Maditinos, & Theriou, 2011) and online databases (Osunade, Ojo, & Ahisu, 2009). Organisational cultural practices that emphasise the development and use of technology-sharing platforms are therefore critical in organisations.

3.11 Conceptual framework for the study

Based on the extensive discussion of the constructs of organisational culture, innovation and knowledge sharing, the conceptual framework of this study is proposed as shown in figure 3.4 below:

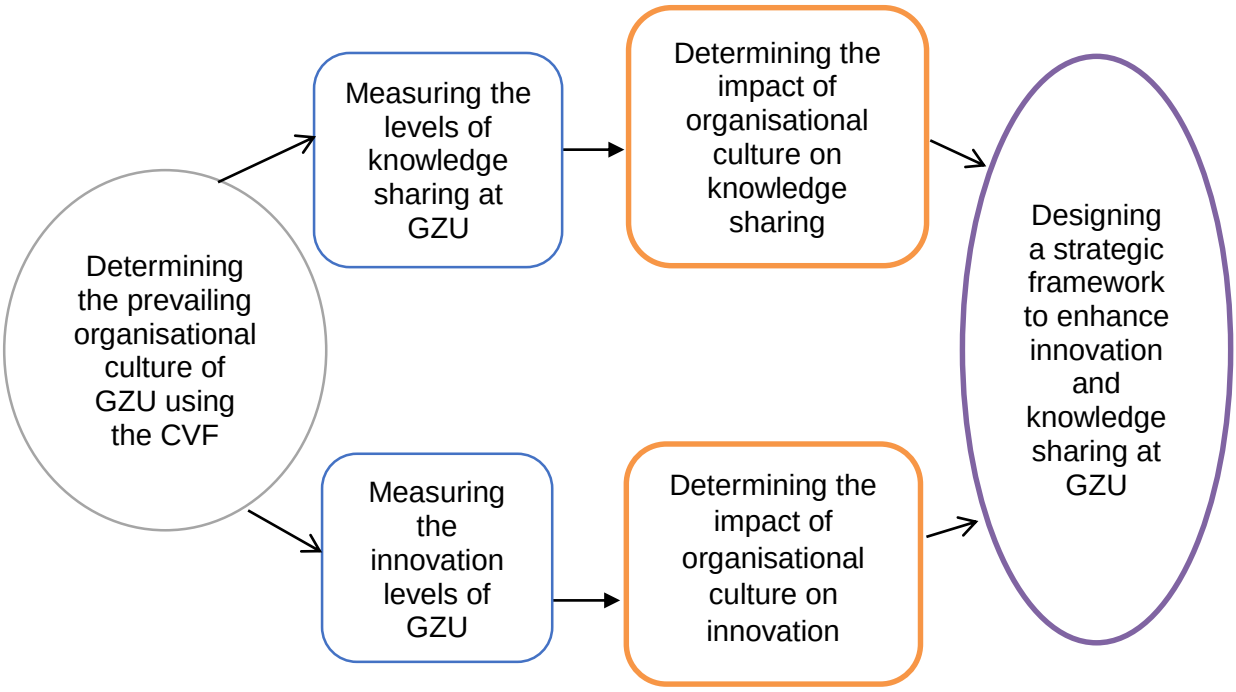


Figure 3.4: A research model for the link between organisational culture, innovation and knowledge sharing
Source: Researcher's own construction

Figure 3.4 above clearly shows the relationship between organisational culture, innovation and knowledge sharing. Previous research has identified that a conducive organisational culture enhances both innovation (see Büschgens *et al.*, 2013; Glisson, 2015; Naranjo *et al.*, 2015) and knowledge sharing (see Al-Alawi *et al.*, 2007; Rega *et al.*, 2014).

3.12 Summary

The world of work is characterised by an environment that is ever-changing. This puts pressure on organisations to continually revisit their business models in order to adapt to this environment. It is not surprising that innovation and knowledge sharing have become important in the contemporary environment. The two variables influence the development of novel practices in an organisation and they are enhanced by a conducive organisational culture.

This chapter provided theoretical perspectives on innovation and knowledge sharing, as well as the factors that influence each of these variables. The chapter explained the Dynamic Capabilities Approach as the theoretical foundation used to construct the innovation measuring instrument. The chapter also discussed the theories of planned behaviour and self-efficacy, which were selected to conceptualise the knowledge-sharing construct and the measuring instrument in the study. Lastly, the link between organisational culture and innovation and knowledge sharing was discussed.

CHAPTER 4: THE EVOLUTION OF UNIVERSITIES WITH SPECIAL REFERENCE TO GREAT ZIMBABWE UNIVERSITY

4.1 Introduction

Globalisation has led to the rapid growth of the knowledge economy, posing unprecedented challenges to the world of business, the broader economy and society at large (Deloitte, 2017). One of the major challenges confronting policymakers has been the need to drive economies through the competitive use of knowledge and technological innovation. This challenge can be solved effectively by universities; hence higher education and research have been identified as crucial components in navigating the global knowledge economy (OECD, 2012).

This chapter addresses the concept of universities in the context of the broad aim of this study. The first part of the chapter reflects on the evolution and new role of universities in society following the emergence of the knowledge economy. This is followed by discussions on the development of the university sector in the Zimbabwean context, innovation and knowledge-sharing policies in Zimbabwe, and the challenges that local universities are facing. The chapter concludes with a profile of Great Zimbabwe University as the main focus of the study.

4.2 Evolution of universities from collegiality to managerialism

Traditionally universities were collegial bodies where decision making was a collective process dominated by academic staff (Burnes, Wend, & By, 2013). This implied that decisions were reached through collaboration and discussion rather than being imposed by a single leader (Chong, Geare, & Willett, 2017). However, today, especially in developed economies, universities are fundamentally shifting away from collegiality towards managerialism, which has become a global phenomenon (see Burnes *et al*., 2013; Chong *et al.*, 2017; Deem, 2011; Peters, 2013; Weinberg & Graham-Smith, 2012). Managerialism in universities involves the adoption of organisational strategies, structures, management instruments and values that are commonly associated with the private sector (Deem, 2011; Teelken, 2012).

The rationale behind the paradigm shift to new managerialism can be viewed from different perspectives. According to Chong *et al.* (2017), the rise of managerialism can be attributed to the decline in state funding which has forced universities to look for alternative sources of revenue. This implies that universities are now expected to place greater emphasis on wealth creation and public engagement (Burnes *et al*., 2013). Wealth creation is achieved by implementing revenue-generating initiatives to close the funding gaps. On the other hand, the need for public engagement as part of university strategy has increased so as to create symbiotic relationships with stakeholders such as government and industry. Similarly, the role of vice chancellors, deans and heads of departments have increasingly become that of knowledge managers charged with running universities through the strategic planning process (Peters, 2013).

The decline in collegiality can also be ascribed to the slow decision-making process associated with consensus building amongst academic peers in the collegiality model. Kligyte and Barrie (2014) argued that collegial structures are unable to respond quickly to the dictates of an ever-changing environment. This is because group decision making is time consuming. Slow decision making can act as an impediment to organisational change, with a negative impact on the effectiveness of universities. In addition, the decisions taken in a collegial model do not necessarily portray the best interest of universities, but can reflect the dominant characters in the system (Burnes *et al.*, 2013). This can result in suboptimal allocation of resources and, ultimately, inefficiencies.

The shortcomings discussed above have led to the adoption of new managerialism in universities.

New managerialism in universities encompasses the adoption of private-sector managerial instruments such as strategic planning, programme evaluation, value addition and performance indicators (Burnes *et al*., 2013), as well as the use of internal cost centres and the fostering of competition amongst employees (Deem, 2011). The adoption of private-sector business models enable universities to improve their sources of revenue in an environment faced with external financial contraction. Not only that, new managerialism puts universities in a better position to contribute to economic development by establishing long-term sustainable relationships with the industry.

A striking feature of new managerialism in universities is the strong emphasis on applied research. This observation is supported by Burnes *et al.* (2013) who opined that the new mandate of universities involves meeting the needs of the economy and solving practical problems through developing applied research. Similarly, Tight (2014) suggested that new managerialism focuses on the development of entrepreneurship research, which, in turn, emphasises knowledge transfer and technological innovation in companies. This feature has influenced the development of entrepreneurial universities.

The concept of new managerialism is beneficial to universities. According to Teelken (2012), the adoption of private-sector management techniques in universities might enhance the performance of universities through high-quality output in teaching and research. This can result in human capital development and the improvement of societal problem-solving capabilities of universities. However, new managerialism has not been spared from criticism. Teelken (2012) mentioned that the increased adoption of a business-oriented approach has caused academics to spend more time on secondary activities such as administrative tasks and assessments at the expense of core university activities. This is likely to affect the commitment levels of employees. Not only that, but Tight (2014) also noted that the democratic participation in decision making of the university citizenry has been seriously eroded with the implementation of the new managerialism.

Although new managerialism might have inadequacies, as pointed out above, the benefits of adopting the approach far outweigh the shortcomings. The adoption of new managerialism can be seen as a perfect response to the demands of the rapidly changing environment of the 21st century. Managing in the 21st century requires an entrepreneurial mindset, which is a key characteristic of new managerialism. Contemporary managers, including those in universities, face pressures such as intense competition, recruitment and retention of human talent, rising client expectations, declining income, the technological and digital innovation wave, as well as workforce diversity. The 21st-century university can respond appropriately to these pressures by redefining its operating model, as discussed below.

4.3 The changing role of universities

The changing role of universities in recent decades has been the subject of considerable research (see Chong *et al.*, 2017; Deem, 2011; Guerrero, Urbano, Cunningham, & Organ, 2014; Kirby *et al*., 2011; Maribel, David, & Aidin, 2015; Urbano & Guerrero, 2013; Tight, 2014). The most significant changes have been the gradual emergence of new managerialism in universities (see Aspromourgos, 2012; Deem, 2011) and the evolution of universities' role in society towards becoming engines of economic development in an increasingly knowledge-driven environment (see Schmitz, Urbano, & Dandolini, 2016; Urbano & Guerrero, 2013).

The role of the modern university has gradually evolved into a three-pronged mission. Traditionally, the first mission of universities was knowledge transfer through education (Philpott, Dooley, O'Reilly, & Lupton, 2011). This meant universities focused on transmitting knowledge by teaching students. However, the need to expand knowledge horizons led to the first academic revolution, which made research the second mission of universities in addition to teaching (Kirby *et al*., 2011).

This dual mission of universities not only produced graduates through the transfer of knowledge, but also created new knowledge through research. However, the teaching and research functions of universities were not adequate response mechanisms to global challenges such as unemployment, the unprecedented growth of the knowledge economy, disease outbreaks, and poverty. This implied that universities had to refocus their efforts to become attuned to the global system.

The knowledge economy emerged after the first academic revolution and played a major role in establishing the second academic revolution. In the second revolution, economic and social development was adopted as a third mission of universities, in addition to teaching and research (Schmitz *et al.*, 2016). The contemporary global system is largely driven by knowledge, information and ideas; hence the ability of universities to apply knowledge competitively in an ever-changing environment has placed these institutions at the centre of economic development (Breznitz & Feldman, 2012).
The third mission of universities covers a broad area. Firstly, it focuses on commercial engagement activities such as technology transfer, licencing and spin-off activities, with

an emphasis on strengthening the entrepreneurship of and within universities (Nelles & Vorley, 2011). Entrepreneurship in universities has resulted in key changes, for example, the establishment of structures such as TTOs, incubators and science parks, and an increase in collaborative activities with stakeholders (Kirby *et al.*, 2011). These entrepreneurial activities do not only improve funding streams for universities, but can also create jobs and promote economic development (D'Este & Perkmann, 2011; Breznitz & Feldman, 2012). Secondly, this third mission has placed universities at the forefront of the fight against global problems such as poverty, hunger, global warming and diseases such as HIV. Thus, the new role of universities involves providing good health care, developing agriculture to maximise results and protecting the environment (Jaramillo, 2012).

The development of entrepreneurial universities has gained momentum especially in developed countries where universities interact closely with industry and government for socio-economic development (Schmitz *et al.*, 2016). One example is Silicon Valley in the USA where the successful contributions of universities to society are clearly visible. Owing to entrepreneurial ecosystems established between universities and industry, global corporations such as IBM, General Electric, Hewlett-Packard and Kodak are flourishing in Silicon Valley (Engel, 2014). Although the adoption of the third mission has many benefits, some challenges can be noted, such as the loss of teaching and research time, conflict of interest, and the increased requirement of secrecy (Philpott *et al.*, 2011).

Owing to their trifold mission, namely teaching, research and entrepreneurship, modern universities are strategic actors in knowledge-based economies (Deiaco, Hughes, & McKelvey, 2012). This is because they are natural incubators for knowledge generation, application and dissemination (Kirby *et al*., 2011), technological innovation (Nelles & Vorley, 2011; Urbano & Guerrero, 2013) and the augmentation of human capital (Breznitz & Feldman, 2012). It is not surprising that universities, including those in Zimbabwe, have been identified as catalysts and engines for regional, economic and social development around the world (Maribel *et al.*, 2015).

4.4 Universities in the Zimbabwean context

Universities are critical to the development of any nation. This is also true for developing countries such as Zimbabwe where, in most cases, they are the only institutions with the capacity to develop highly skilled manpower, transfer technology and generate new knowledge (Kariwo, 2007). It was for this reason that higher education was formally introduced in Zimbabwe in 1957 with the establishment of the then University College of Rhodesia and Nyasaland (Garwe, 2014). After independence in 1980, this university was renamed the University of Zimbabwe.

After independence, the new Zimbabwean government devised policies to expand education and accommodate the underserved population at primary and secondary level. The new policy was primarily meant to address historical imbalances prevalent before independence (UNESCO, 2014). This move resulted in a massive demand for secondary education. Prior to independence in 1980, 20% of primary school graduates proceeded to secondary school; post independence, this increased to 86% (Kariwo, 2007).

This surging demand for secondary education exerted pressure on the education infrastructure of the country's single university (Kariwo, 2007). For this reason, the government of Zimbabwe established a second public university in 1991: the National University of Science and Technology (UNESCO, 2014). Since then the government has facilitated the establishment of more universities, reaching a number of 13 public universities and six private universities in 2018 (Ministry of Higher & Tertiary Education Database (online), 2018). The public and private university landscape in Zimbabwe is shown in table 4.1 below:

Table 4.1: Public and private universities in Zimbabwe

Public universities	Private universities
Bindura University of Science Education (BUSE)	Africa University
Chinhoyi University of Technology (CUT)	Solusi University
Harare Institute of Technology (HIT)	Women University in Africa
Lupane State University (LSU)	Catholic University
Midlands State University (MSU)	Ezekiel Guti University
Great Zimbabwe University (GZU)	Reformed Church University
National University of Science and Technology (NUST)	
University of Zimbabwe (UZ)	
Zimbabwe Open University (ZOU)	
Gwanda State University (GSU)	
Manicaland State University of Applied Sciences (MSUAP)	
Marondera University of Agricultural Sciences and Technology (MUAST)	
National Defence University (NDU)	

Source: Ministry of Higher & Tertiary Education Database (online), 2018

From table 4.1 above it is clear that Zimbabwe has more public than private universities, which could be attributed to the high costs involved in setting up universities. Almost all the universities in Zimbabwe offer a wide range of disciplines in the Humanities, Social Sciences, Business Studies, Architecture and the Natural, Health and Pure Sciences, as well as Engineering and Agriculture. However, some state universities were established with a niche focus. For example, NUST, BUSE, HIT, CUT, MSUAP and MUAST focus on Science, Technology, Engineering and Mathematics (STEM) curricula.

With the establishment of STEM universities, government aimed to enhance the level of innovation in the economy. However, though government has tried to establish a niche focus for each of the newer universities, this strategy has changed in recent years: Institutions are now engaging in concerted efforts to increase student enrolment by offering curricula across a range of disciplines in order to raise the funds necessary for cost-sharing (Kotecha & Perold, 2010). The core functions of Zimbabwean universities have been strongly centred in teaching and learning (approximately 57% focus), research (approximately 28%) and community service (approximately 15%) (Kotecha & Perold, 2010). From this, it is apparent that Zimbabwean universities have, to a large extent, maintained the traditional role of a university. The section below discusses the academic research landscape in Zimbabwe.

4.5 Current research and innovation practices in Zimbabwe

Academic research is the backbone of innovation and knowledge sharing (see Mansfield, 1991; Quintas, Wield, & Massey, 1992; Lim, 2004; Perkmann, Tartari, McKelvey, Autio, Broström, D'Este, & Sobrero, 2013), because it is through scientific research that new knowledge is created. New knowledge may be shared with industry and government to create new products and services, and to solve national challenges. Not only does academic research influence innovation practices and knowledge sharing, but it also enhances Gross Domestic Product (GDP) per capita (see Konrad & Wahl, 1990; Ye, 2007; Lemarchand, 2012). Thus, for a country to advance innovation and increase GDP levels, a solid scientific research foundation is paramount.

Due to a lack of current data on research statistics in Zimbabwe, research data for the year 2012 were used to compare Zimbabwean scientific research output with that of other African countries. The comparison is shown in table 4.2 below.

Table 4.2: Mainstream scientific publications from top five African countries in 2012

Country	Articles	Citable articles	African rank	World rank
South Africa	13 627	12 766	1	34
Tunisia	5 170	4 820	2	52
Nigeria	4 748	4 552	3	53
Algeria	3 800	3 667	4	54
Morocco	3 282	3 037	5	56
Zimbabwe	373	358	16	107

Source: UNESCO (2014)

According to table 4.2, South Africa occupied the pole position with respect to the number of scientific publications. This signifies a strong foundation of research activities in the country in comparison with other African nations. The same cannot be said about Zimbabwe, whose research landscape is weak in comparison with other African countries. The country was ranked 107 in the world and 16 out of 52 countries in Africa. This weak position can be partly explained by the absence of financial incentives and adequate policy instruments to promote research and innovation in Zimbabwe (UNESCO, 2014).

A weak research capacity affects the innovation output and the ability of the country to collaborate with local industry, as well as peers in the region and the diaspora. As table 4.2 indicates, in 2012 only 373 scientific articles were published by research centres in Zimbabwe. This figure may decrease if only articles originating from universities are considered. Evidently, the research landscape of Zimbabwean universities is yet to be fully developed, and government intervention is needed urgently to promote and enhance research activities in the country.

4.5.1 The development of research and innovation policy in Zimbabwe

In line with the key objective of modernising and industrialising Zimbabwe, and having identified inadequacies with regard to innovation, government formulated the Science and Technology policy in 2002 (UNESCO, 2014). This policy was designed to stimulate research and industrial innovation by promoting national scientific and technological self-reliance. This was to be achieved by:

- Rapid and sustainable industrialisation through R&D
- R&D that focused on establishing an effective health delivery system
- Using science and technology to exploit renewable and non-renewable energy resources
- Providing adequate technology to improve food production

Based on the objectives of the Science and Technology policy of 2002, the government of Zimbabwe established the Department of Science and Technology in the office of the president and cabinet in August 2002, which was later to become a fully-fledged Ministry in 2005 (UNESCO, 2014). The mandate of the newly created department, and later the ministry, was to spearhead the operationalisation of the Science and Technology policy.

Globalisation and its consequences, such as the ever-changing technological environment and cut-throat global competition, necessitated a revision of the Science and Technology policy of 2002. In 2012 the second Science, Technology and Innovation policy of Zimbabwe was introduced (UNESCO, 2014) with the primary goals to:

- Strengthen capacity development in science, technology and innovation
- Learn and utilise emerging technologies to accelerate development

- Accelerate the commercialisation of research results
- Search for scientific solutions to global environmental challenges
- Foster international collaboration in science, technology and innovation

Zimbabwean universities as creators and disseminators of research knowledge were to play a significant part in fulfilling the primary goals of both the first and second Science, Technology and Innovation policy. However, as acknowledged in the introductory section of this study, innovation metrics in Zimbabwe indicate that innovation is not progressing as envisaged; hence the country is failing to achieve the targets of the second Science, Technology and Innovation policy.

A closer analysis of Zimbabwe's innovation metrics confirms that the country is lagging behind in advancing the innovation agenda. According to Dutta *et al.*, (2018) the country is ranked 105 out of 126 countries with regard to innovation linkages. This means that there is a weak relationship amongst the universities, industry and government when it comes to promoting innovative practices. Furthermore, in the same ranking of 126 countries, the country is ranked low on the following innovation metrics: ICT access (107), knowledge diffusion (119), ICT and business model creation (117) and knowledge workers (107) (Dutta *et al.*, 2018). This confirms that universities and other research agencies are failing in their mandate to fulfil the objectives of the second Science, Technology and Innovation policy.

Zimbabwean universities are confronted with a myriad of challenges which, to a large extent, have weighed down the progress towards realising the objectives of the second Science, Technology and Innovation Policy.

4.5.2 Challenges facing Zimbabwean universities

The challenges confronting Zimbabwean universities must be viewed in the context of the country's historical and current economic performance. This study argues that there is a link between the performance of the Zimbabwean economy and the problems that university managers are currently facing. The paragraphs below provide a synopsis of the current Zimbabwean economic landscape.

The Zimbabwean economy, once amongst the most advanced in sub-Saharan Africa, has become one of the most vulnerable in this region. In 1980, GDP per capita in Zimbabwe was higher than in most of its neighbouring countries. Manufacturing accounted for a large share of GDP, and the quality of health and education services was high (IMF, 2017). However, between 1998 and 2008, Zimbabwe experienced escalating economic challenges which affected almost all sectors of the economy and took on crisis proportions in 2007 and 2008 (UNESCO, 2014), largely because of the chaotic land reform programme of the late 1990s and excessive fiscal deficits (IMF, 2017).

The economic downturn caused widespread unemployment, poverty and high inflation (UNESCO, 2014), and a substantial part of the skilled workforce emigrated (IMF, 2017). Though the economy is showing signs of improvement currently, the country is still in the quagmire. Also, Zimbabwean universities have not been spared by the challenges described above. Thus, it is fair to argue that most of the challenges confronting university management today have a historical link with the developments in the greater Zimbabwean economy. These challenges are experienced in the following areas: teaching and learning, research, management, governance and planning, and infrastructure. Each will be discussed below.

Challenges related to teaching and learning

Zimbabwean universities have identified the need for qualified academic and teaching staff as their number one priority (Kotecha & Perold, 2010). The period of the economic meltdown, especially between 2002 and 2008, saw poor remuneration for university staff. Consequently, highly qualified and experienced lecturers moved from Zimbabwean universities to those in the SADC region and the diaspora. This created a huge skills gap, which has been a major challenge ever since. High vacancy rates have been reported especially in the field of engineering, sciences and medicine (Comesa, n.d.). According to the Zimbabwe Medium Term Plan (2011–2015), the brain drain has negatively affected service delivery at institutions of higher learning.

The need to train, develop and attract skilled and qualified lecturers has therefore become a major priority in ensuring high-quality service delivery at universities. However, according to the Zimbabwe Medium Term Plan (2011–2015), the country has

failed to attract those skilled and qualified professionals who had left to return and contribute to the development of the country. One reason for this failure is the inadequate provision of incentives and retention schemes for the recruitment and retention of qualified and experienced staff at tertiary institutes. The lack of highly skilled and qualified academics is likely to affect the nation's ability to adapt to the current and projected needs of the economy.

Furthermore, the lack of highly skilled academics may affect the competitiveness of universities and, ultimately, their internationalisation. A study by the Southern Africa Regional University Association (SARUA) in 2010 observed that there were virtually no foreign staff and foreign students at Zimbabwean universities. This might have been an indication at that time of the negative perceptions of non-Zimbabweans towards local universities. The other pressing challenge that universities are facing is the inadequacy of basic resources such as teaching equipment, teaching facilities and well-equipped libraries (Kotecha & Perold, 2010). For universities to thrive, there has to be adequate provision of computers and Internet access. The low research and innovation output in Zimbabwe can be traced back to the shortage of basic teaching and research resources such as highly skilled lecturers, Internet access and libraries.

Challenges related to research

Several factors affect the research landscape in Zimbabwe:

- Research funding
- Research collaboration
- Challenges related to infrastructure
- Challenges related to human resource policy for science and engineering
- Challenges related to operational policy instruments for promoting research and innovation
- Challenges related to economic growth
- Challenges related to state funding
- Challenges related to R&D

Research funding: Research funding has been identified as a pressing need for Zimbabwean universities (Kotecha & Perold, 2010) and other research agencies. The poor economic climate in the country, especially between 2002 and 2008, has led to most donors' suspending their operations (UNESCO, 2014) and, consequently, the drying up of donor-funded research. The subdued economic climate, which has persisted up to 2018, has also severely constrained research funding. Universities have struggled to access the latest scientific equipment and sponsor students who are pursuing research and other higher degrees. Unsurprisingly, the latest figures indicate that Zimbabwe is still ranked low, namely 112 out 126 countries, on the R&D index (Dutta *et al*., 2018).

Research collaboration: The poor state of scientific research output discussed earlier has affected collaborative arrangements with industry. University–industry collaborative arrangements are weak in Zimbabwe (UNESCO, 2014) except for the longstanding tobacco industry (Kraemer-Mbula & Scerri, 2015). This can be attributed to the current regulatory framework in Zimbabwe which hampers the transfer of technology to industry and the development of industrial research (Kraemer-Mbula & Scerri, 2015). The regulatory framework does not support commercialisation of research, which has been identified as one of the major goals in the second Zimbabwean Science, Technology and Innovation policy of 2012.

Challenges related to infrastructure*:* Universities in Zimbabwe are in dire need of the requisite infrastructure to improve teaching and research (Kotecha & Perold, 2010). Given the current economic crisis, and the fact that some universities were established during the period of unimaginable economic decline, most institutions have failed, and are still failing, to construct supporting infrastructure. The top priorities for infrastructure are teaching space (e.g. lecture rooms), student accommodation and laboratory space.

Challenges related to human resource policy for science and engineering: According to the UNESCO report of 2014, innovation in Zimbabwean universities, and in the economy in general, is being hampered by a lack of specific targets from government to increase the number of scientists and engineers. There is also no clear system of government scholarships in place for completing PhDs in science and engineering. This lack of proper planning and support militates against the drive to

promote innovation at universities. Furthermore, because of the brain drain and the poor remuneration package for SETI experts, the vacancy rates for SETI posts – both in teaching and research – are high (UNESCO, 2014).

Challenges related to operational policy instruments to promote research and innovation: Government policy instruments are necessary to support research and innovation; however, in Zimbabwe, policy framework is weak. According to the UNESCO (2014) report, the following aspects impinge on research and innovation:

- ✓ No tax relief is available from the Zimbabwe Revenue Authority for the importation of research equipment and consumables.
- ✓ There is a lack of adequate legislation to promote innovation and attract foreign direct investment and specific tax incentives or other schemes to promote entrepreneurship and the commercialisation of research results.
- ✓ The Innovation and Commercialisation Fund of the Ministry of Higher and Tertiary Education, Science and Technology Development is not being consistently funded.
- ✓ There are no policy instruments in place to promote linkages between the SETI demand and supply sides, nor any funding mechanisms addressing the research priorities set up by the Research Council of Zimbabwe or the Second Science, Technology and Innovation policy.

As most researchers are based at universities, this weak policy framework does not promote research and innovation at Zimbabwean institutions of higher learning. This poses a major challenge to university managers trying to drive academic research. The institutions driving SETI in Zimbabwe, including universities, are fragmented and poorly coordinated. Moreover, the research priorities set by the Research Council of Zimbabwe differ from those set by line ministries such as the Ministries of Higher Education, Health and Energy (UNESCO, 2014).

This lack of coordination results in the duplication of activities, an absence of synergies, and inefficiency. Clearly, it is advisable to establish a national research body with the responsibility of coordinating policy formulation, design, implementation, funding and assessment of all research and innovation in the country. This will also help universities direct their efforts towards achieving clear research priorities.

Challenges related to economic growth: The real growth in Zimbabwe's manufacturing sector has been declining since 2011. Manufacturing grew by 14% in 2011, 2.3% in 2012 and 1.5% in 2013 (UNESCO, 2014). According to the Reserve Bank of Zimbabwe Quarterly Economic Review 2017, the real growth rate for manufacturing was estimated to be 0.30% in 2016 and 0.1% in 2017. These macro-economic conditions hamper research and innovation in the business and enterprise sector. A declining manufacturing sector reduces not only opportunities for collaboration with researchers from universities, but also the sources for research funders, which is detrimental to innovation and knowledge sharing.

Challenges related to state funding: In the past, research institutions and universities have depended heavily on government research grants. However, since the year 2000, this support has dwindled alongside the economic downward spiral. Today, the monetary support from government is being directed towards payment of recurrent expenditures such as salaries. This hampers the development of research activities at universities, which has created the need to increase the participation of private research funding and international cooperation.

Challenges related to R&D: The linkages between universities, R&D centres and the business and enterprise sector are weak (Dutta *et al.*, 2018). With the exception of the tobacco industry and other specific agriculture-oriented cases, collaboration between industry and academia in Zimbabwe has been weak (UNESCO, 2014). This affects the commercialisation of research results, despite it being one of the major objectives of the government's Science, Technology and Innovation policy. A further impediment is the absence of appropriate policy instruments and tax incentives to promote innovation in the industry and commerce subsectors.

4.5.3 Opportunities for Zimbabwean universities

Despite the myriad of challenges discussed above, opportunities abound for Zimbabwean universities, namely human capital development, the potential for collaboration with national, regional and international counterparts, and the possibility of adding value to natural resources. These will be described briefly below.

Human capital development in science and engineering: Zimbabwe's population is dominated by youth who are eager to study and develop their potential. Universities have an opportunity to train young people in science and engineering by providing incentives, like scholarship programmes, to encourage students to enrol for higher degrees in priority fields determined by national policies. At present, government is encouraging high school students to study STEM subjects.

National, regional and international collaboration: Opportunities exist to promote synergies and networking amongst national laboratories, universities and the manufacturing sector. University leadership can partner with foreign institutions to advance research. This strategy has seen GZU entering into partnership with the Central University Technology and University of Venda from South Africa. Collaboration and networking in research and innovation, amongst both local and international universities, can lead to a better higher education system and greater scientific productivity (UNESCO, 2014).

Adding value to natural resources: Universities have an opportunity to add value to the abundant natural resources in Zimbabwe. Value addition across all sectors in Zimbabwe remains low as the country is still a net exporter of raw materials (UNESCO, 2014). Researchers from universities have an opportunity to apply their research results to add value across sectors such as agriculture, timber, mining, textile and leather.

4.6 Profiling Great Zimbabwe University

Great Zimbabwe University is located in the southern part of Zimbabwe in the city of Masvingo. According to the GZU Annual Report of 2015, the university was established in 1999 as the Masvingo State University and renamed GZU in 2007 after an amendment of an Act of Parliament. The vision of the university is to be the centre of excellence in Arts, Culture and Heritage Studies, as well as to advance other academic disciplines for the development of the Zimbabwean society. The niche focus of the university is, therefore, to advance research knowledge in Arts, Culture and Heritage Studies.

The academic disciplines of the university are practised in the School of Arts, Culture Heritage Studies, the School of Agriculture and Natural Sciences, the School of Commerce, the School of Education, the School of Law and the School of Social Sciences. The next two sections will set out the staff compliment and student enrolment at GZU and the associated implications for research.

Staff statistics of GZU

One of the variables that is used to measure the size of an organisation is the number of employees. Table 4.3 below is a summary of the staff size at GZU.

Table 4.3: Staff statistics at GZU

	Male	Female	Total
Academic	242	98	**340**
Non-academic	361	255	**616**
Grand total	**603**	**353**	**956**

Source: GZU HR Office Report (2018)

According to table 4.3, the university employs more males than females, with a slightly high gender imbalance in favour of males. However, this study is more concerned with the academic staff, as they are most likely to spearhead research and innovation at the university. Table 4.4 below gives a breakdown of the academic staff at GZU.

Table 4.4: Academic staff at GZU

Faculty	Professor	Associate professor	Lecturer (with PhD)	Lecturer (with master's)	Assistant lecturer	Teaching assistant	Total
Arts, Culture and Heritage	1	3	25	41	2	0	**72**
Agriculture and Natural Sciences	0	2	3	29	0	0	**32**
Commerce	0	0	5	53	0	1	**59**
Education	4	6	25	74		1	**110**
Law	0	0	1	7	0	0	**8**
Social Sciences	1	0	7	48	0	1	**57**
Total	**6**	**11**	**66**	**252**	**2**	**3**	**340**

Source: GZU HR Office Report (2018)

From table 4.4, two important observations can be made. The first is that there is a low number of academic staff with PhDs and professorial qualifications. Only 19.4% of the academic staff are PhD holders, whilst 5% are qualified professors. This can have a negative bearing on the quality and quantity of GZU's research output. As indicated in the literature, personnel with advanced research qualifications are likely to be instrumental in producing applied research at universities; hence there has to be a deliberate effort by university management to support academic staff in attaining higher degrees.

The second observation is that the STEM faculty (School of Agriculture and Natural Sciences) has the second lowest compliment of lecturers in addition to the three PhD holders and two associate professors. This faculty, as a STEM division, is expected to advance the research and innovation agenda; however, with such a low number of PhD holders and professors, it may be challenging to realise this objective. It is therefore critical for the university to draw more PhD holders and professors to this faculty to spearhead research in sciences and technology.

Student enrolment at GZU

Due to the increasing demand for higher education, enrolment at GZU has been rising steadily over the years. The student population of **4 481** in 2012 (UNESCO, 2014) has risen to **13 598** by 30 May 2017 (Zimstat, 2018) – representing a phenomenal rise of

203% in five years. This student population is spread over six faculties, as shown in table 4.5 below. Two important conclusions can be drawn from the data presented in table 4.5. The first is that there are more females than males enrolled. This is in line with national gender statistics which is skewed towards female dominance: 6.8 million to 6.3 million males (Zimstat, 2012). The second conclusion is that the faculty of education has the highest enrolment figure, with 48% of the total student population. The mainstream distribution of students by faculty and gender is shown in table 4.5 below:

Table 4.5: Student enrolment by gender

Faculty	Male	Female	Total
Agriculture and Natural Sciences	403	228	631
Arts	628	738	1 411
Commerce	1 157	929	2 086
Education	2 070	4 426	6 496
Law	49	73	122
Social Sciences and Humanities	1 237	1 615	2 852
Total	**5 544**	**8 054**	**13 598**

Source: Zimstat Database (2018)

The statistics in table 4.5 points to a likelihood of less applied research being conducted at GZU because of the low number of students in the STEM faculty. Students in the STEM faculty (Agriculture & Natural Environment and Sciences) make up only 4.5% of the total student population. This calls for a deliberate effort by university management to design strategies to enhance enrolment in STEM-oriented faculties.

Scientific research output of GZU

As an emerging university, GZU's research landscape has not been fully developed. This can be explained partly by the distribution of students in the faculties, reflecting low student numbers in the STEM faculties. Table 4.6 below gives a comparison of GZU's scientific research output and that of other Zimbabwean universities over an 11-year period.

Table 4.6: Distribution of mainstream scientific publications in Zimbabwean universities (2002–2013)

University	Scientific articles	Rank
University of Zimbabwe	1 729	1
National University of Science and Technology	190	2
Bindura University of Science Education	92	3
Chinhoyi University of Technology	23	4
Zimbabwe Open University	21	5
Great Zimbabwe University	15	6
Africa University	15	6
Harare Institute of Technology	1	7

Source: UNESCO (2014)

From table 4.6 above, two important conclusions can be drawn. Firstly, the scientific research output is largely skewed towards one university, namely the University of Zimbabwe. This is the most productive research university probably because, being the oldest institution of higher learning in Zimbabwe (in existence since 1957), it is benefiting from its well-established brand. Fellow researchers and sponsors from the region and beyond are likely to partner with the University of Zimbabwe.

On the other hand, emerging universities, including GZU, are still trying to establish themselves in the ever-changing and competitive university sector. From 2002 to 2013, GZU has published 15 scientific articles. This figure is a far cry from the research output required to make a meaningful impact in society. Clearly, there is a need for strategic priorities to enhance the level of research at the institution. With the current level of scientific research output at GZU, there is a likelihood of low levels of innovation and knowledge sharing at the university.

4.7 Summary

This chapter provided an overview of the university sector in general and Zimbabwean universities in particular with specific reference to GZU. The chapter discussed the evolution and trifold mission of the modern university. The chapter also elaborated on the development of universities in Zimbabwe and the challenges confronting university

managers. Lastly, the chapter profiled the GZU with regard to staff compliment, student enrolment and research output.

CHAPTER 5: RESEARCH METHODOLOGY

5.1 Introduction

According to Salkind (2018), research can be described as a process through which new knowledge is discovered. In a business sense, research encompasses a systematic and organised effort to investigate a specific problem that requires a solution (Sekaran & Bougie, 2016). It generally involves a series of steps that are designed and executed with the goal of finding answers to issues that are of concern to the researcher. Zikmund *et al.* (2010) contend that research is important in an organisation because it helps in the decision-making process – appropriate decisions should be taken after the research process has been completed.

Research can be categorised into applied and basic research. According to Sekaran and Bougie (2016), applied research is conducted to solve current problems faced by managers in the work setting which demand timely solutions. On the other hand, basic research is the type of research that is conducted without a specific decision in mind (Zikmund *et al.*, 2010). Instead it attempts to expand the limits of knowledge in general and not to solve a particular pragmatic problem. Basic research acts as a basis for applied research. The findings of basic research can be used to solve organisational challenges at a later stage. The current study can be categorised as applied research, as it proposes a strategic framework for enhancing innovation and knowledge sharing at GZU.

When undertaking research, a methodology has to be developed. Wahyuni (2012) suggests that a research methodology is a framework used to conduct research within the context of a certain paradigm. Methodology includes the underlying set of beliefs that guide a researcher to select one set of research methods over another. In other words, the methodology is the logic behind the selected research approach and design and the analytical strategy that underpins significant research.

This chapter describes the research methodology that was used in the study. It explains the systematic process that was followed to solve the research problem, as well as the research approach and design applied to the study. The population, sampling technique and research instrument used to collect the empirical data are set out. Data analysis

comprised two stages, namely descriptive and inferential statistics. These two stages are also explained in this chapter.

5.2 Research philosophy/paradigm

Research philosophy is central to any kind of research. Thus, prior to undertaking any investigation, researchers have to determine their research philosophy as a basis for the research design (Bahari, 2010). The two main philosophical assumptions in research are ontology and epistemology (Wahyuni, 2012). They serve as a thinking framework that guides the researcher's behaviour. Ontology is concerned with the nature of social entities (Bryman & Bell, 2011), whereas epistemology is the theory of knowledge, especially its validation and the research methods used to generate it (Nicholas, 2010).

The current study adheres to the ontological position of objectivism and the epistemological position of positivism, as mentioned before. These positions advocate for the use of scientific approaches to generate acceptable knowledge (Wahyuni, 2012). According to Mack (2010), positivism was first described by Auguste Conte, who believed that reality can be observed and that genuine knowledge is based on experience and can be advanced by means of observation and experiment. It was from this thinking that proponents of positivism advocated for the application of natural science principles to social sciences. Positivists believe that different researchers observing the same factual problem in a large sample are likely to generate a similar result by using similar research processes (Wahyuni, 2012). According to Saunders *et al.* (2009), positivism emphasises quantifiable observations that can be analysed statistically.

5.3 Research approach and design

The current study followed a quantitative research approach. Bryman and Bell (2011) noted that quantitative research involves quantification in the collection and analysis of data and embodies a view of social reality as being external and objective. The view of social reality as external to the researcher is in line with Szyjka's (2012) contention that quantitative researchers do not interfere with study findings. This implies that the generation of data will be independent of human opinions and judgements.

According to Bahari (2010), the quantitative researcher primarily uses positivist claims for developing knowledge such as cause and effect thinking, reduction to specific variables, hypotheses and the testing of theories. In a similar vein, Yilmaz (2013) opined that quantitative research is based on the objectivist epistemology and thus seeks to develop explanatory universal laws in social behaviour by statistically measuring and analysing causal relationships amongst variables. The assertions by Bahari (2010) and Yilmaz (2013) resonate well with the objective of this study. The positivist stance in quantitative research also follows a highly structured methodology to allow the replication of research results.

A research design provides a framework for data collection and analysis (Bryman & Bell, 2011). As Sekaran and Bougie (2016) contended, a research design is a blueprint or plan for the collection, measurement and analysis of data with the aim to answer research questions. The choice of design reflects the priority given to elements of the research process such as design methods, sampling and data analysis techniques.

A survey design was adopted in this study because it was found suitable for addressing the research problem and related research questions. According to Bryman and Bell (2011), a survey design, especially the cross-sectional design, enables the collection of quantifiable data concerning two or more variables from more than one case at a single point in time. For this reason, the survey design was found suitable for the study, because quantifiable data had to be collected from a cross-section of the university community, which included lecturers from five faculties, administration staff and top management. Furthermore, the survey design is applicable where an examination of the relationship between variables is required (Bryman & Bell, 2011).

This study used a self-administered questionnaire to address the research questions and the study problem. According to Sekaran and Bougie (2016), the questions in a survey instrument are typically arranged into self-administered questionnaires that respondents complete on their own. Therefore, the survey design supports the research instrument developed for this study, especially because it allows quantitative data to be collected and analysed using descriptive and inferential statistics (Saunders *et al.*, 2009). In this study, the data were analysed descriptively using graphs, pie charts and frequencies. Structural equation modelling, specifically PLS-SEM, was applied to examine the

relationship between the variables. The researcher therefore believes that the contextual conditions of a survey design are highly applicable to the phenomenon under investigation.

5.4 Population

The concept of 'population' refers to the entire group of people, events or objects of interest that the researcher wishes to investigate (Sekaran & Bougie, 2016). MacMillan and Schumacher (2010) concur by defining a population as a group of elements, cases, individuals, events or objects that conform to specific criteria. The population for the study included all the staff members of GZU, i.e. 956 individuals. According to the GZU human resource department, this number consists of 340 academic staff (including junior and senior lecturers, associate professors and professors) and 616 administrative staff members (including top management and all support administration staff).

5.5 Sampling

Sampling is the process of selecting a sufficient number of the right elements from the population so that a study of the sample and an understanding of its properties or characteristics will allow the researcher to generalise such properties or characteristics to the population elements (Sekaran & Bougie, 2016). As indicated above, the population of this study comprised 956 GZU employees. According to Israel (1992), for any population between 900 and 1 000, a sample of 277 is sufficient (at a confidence level of 95%).

Simple random sampling was used to select individuals from the different sections of the university. Simple random sampling is the most common type of sampling procedure, and each member of the population has an equal and independent chance of being selected (Saunders *et al.*, 2009). The GZU human resource department provided the researcher a list of all academic and administrative staff members to enable sampling. As mentioned before, a sample size of 277 employees participated in the study, from which 195 individuals completed the survey successfully, thus giving a response rate of 70.39%.

5.6 Data-gathering instrument

As indicated before, this study used a structured questionnaire to gather data from the participants. A structured questionnaire contains predetermined response categories from which the varying perspectives of respondents can be captured (Yilmaz, 2013). In studies involving large samples to be analysed quantitatively, such as the current study, a questionnaire becomes the most suitable data-gathering instrument (Sekaran & Bougie, 2016). Furthermore, structured questionnaires contain standardised questions that can be interpreted the same way with targeted respondents (Saunders *et al*., 2009), thus improving the quality of the research output.

In this study, a questionnaire, namely the 'questionnaire on the impact of organisational culture on innovation and knowledge sharing at GZU', was constructed in line with the literature review (chapters 2 to 4), the theoretical framework and the research objectives. The questionnaire was also designed to be self-administered and was completed online using the SurveyMonkey platform. The questionnaire consisted of four sections as explained below (see annexure A):

Section A: *Demographics*
This section captured the demographic profile of respondents including gender, work section, qualification, current position in the organisation and number of years in current position at GZU.

Section B: *Organisational culture*
Section B captured the prevailing organisational culture based on the CVF by Cameron and Quinn (2011). This part of the questionnaire contained measurement items in four categories, namely clan culture, adhocracy culture, hierarchical culture, and rational culture.

Section C: *Innovation*
Section C measured the innovation construct using the five factor model scale developed by Dobni (2008). The factors are implementation context, employee creativity and empowerment, organisational constituency, organisational learning, and innovation propensity. They are explained below.

Innovation implementation context measured the ability of GZU to execute value-added ideas and to proactively align with a changing environment.

Creativity and empowerment measured the degree of empowerment and the creative capacity of GZU employees.

Organisational constituency measured the degree to which GZU employees are engaged in the innovation imperative, as well as employees' perception of their contribution towards innovation vis-à-vis their colleagues' perception.

Organisational learning measured the degree to which the training and educational opportunities of GZU employees are aligned with innovation objectives.

Innovation propensity measured the degree to which GZU has a formally established architecture such as goals, vision and business models to develop and sustain innovation.

Section D: *Knowledge sharing*

Section D measured the level of knowledge sharing at GZU by means of a scale developed by Jolaee *et al.* (2014). The scale included subjective norms, self-efficacy, organisational support, attitude to knowledge sharing and the intention to share knowledge.

5.7 Pilot study

A pilot study is a small-scale research project that collects data from respondents similar to those who will participate in the full study (Zikmund *et al*., 2010). For the current study, a pilot study was carried out on 27 and 28 February 2019. Fifteen members of the management studies department at GZU participated and they were excluded from the main study. The objective of the pilot study was to pre-test the research instrument to guarantee data quality and accuracy, and thus reduce the risk of a flawed research process. The pilot study indicated that no changes were required to the research instrument.

5.8 Data collection

Before data collection, the researcher sought and was granted permission by GZU to carry out this study. Also, as part of the instructions section of the questionnaire, the anonymity and confidentiality of respondents were confirmed, and they were assured that their responses would be used for research purposes only.

5.9 Fieldwork challenges

The researcher experienced the following challenges during data collection:

- Some respondents declined to participate in the study.
- Internet connectivity challenges at GZU delayed the process of data gathering.

5.10 Data analysis

Data analysis is the application of reasoning to understand the data that were gathered in an investigation (Zikmund *et al*., 2010). In line with current trends in research on organisational culture (see Kamaşak & Bulutlar, 2010; Kokt & Ramarumo, 2015; Valmohammadi & Roshanzamir 2015) and innovation and knowledge sharing (see Jolaee *et al.*, 2014; Naranjo *et al.*, 2015), the following statistical tests were applied in this study:

- Frequency tables, pie charts and graphs were used for descriptive analysis.
- PLS-SEM was applied to validate the relationship amongst the three constructs (organisational culture, innovation and knowledge sharing). It was also used to measure reliability and validity of the measurement items.

5.11 Summary

This chapter described the study's research methodology. It explained the research philosophy and design which were selected in line with the study's aims and objectives, namely to determine the impact of organisational culture on innovation and knowledge sharing at GZU. The chapter also outlined the tools and procedures that were applied in the planning, design and execution phases of the research, which included the data-

gathering instrument. Lastly, the chapter identified the fieldwork challenges encountered in this research and described the statistical tests applied in interpreting the collected data.

CHAPTER 6: DISCUSSION AND ANALYSIS OF FINDINGS

6.1 Introduction

Chapter 5 provided a description of the methodology applied in the study. This chapter presents the analysis and findings of the structured questionnaire. As indicated, there was a 70.39% response rate from a targeted sample of 277 respondents. Both descriptive and inferential statistics were applied to interpret and analyse the data. SurveyMonkey was used to generate the descriptive statistics, whilst the statistical package SmartPLS version 3.0 was used to conduct the PLS-SEM analysis.

6.2 Descriptive statistics

Descriptive statistics refers to statistics such as frequencies, the mean, and the standard deviation which provide descriptive information about a set of data (Sekaran & Bougie, 2016). In this study, frequency tables, graphs and pie charts were used to describe data.

6.2.1 Demographic profile of respondents

This section describes the demographic variables of the respondents. The demographic data consisted of gender, highest qualification, work section, position and work experience.

In question 1, respondents had to indicate their gender. As indicated in figure 6.1 below, there were 103 male and 92 female respondents, representing 53% and 47% of the total number of 195 respondents respectively.

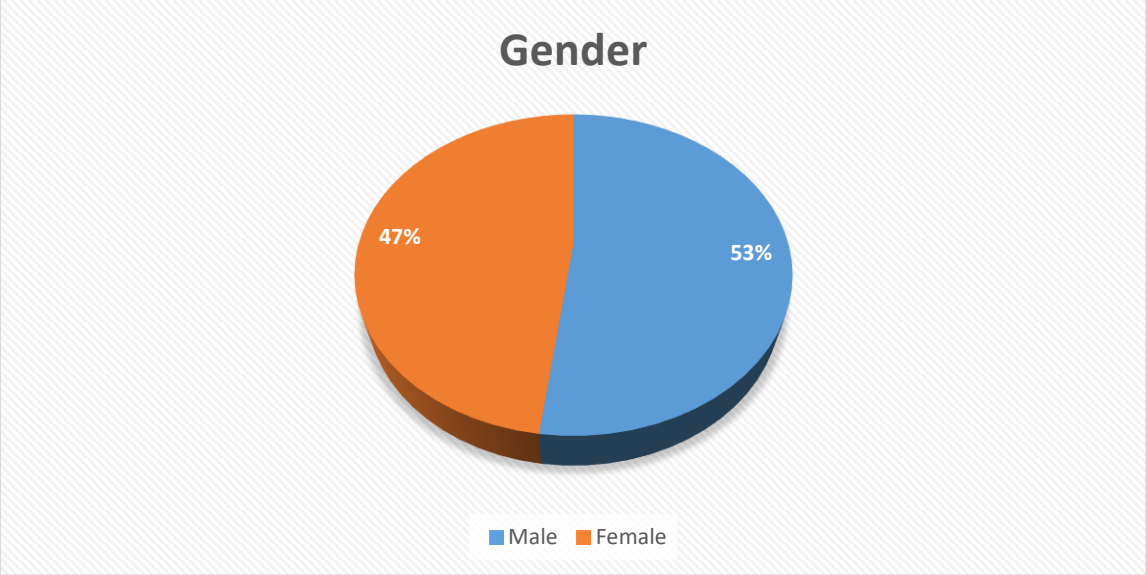


Figure 6.1: Gender of respondents

In question 2, respondents had to indicate their work section. This is presented in figure 6.2 below.

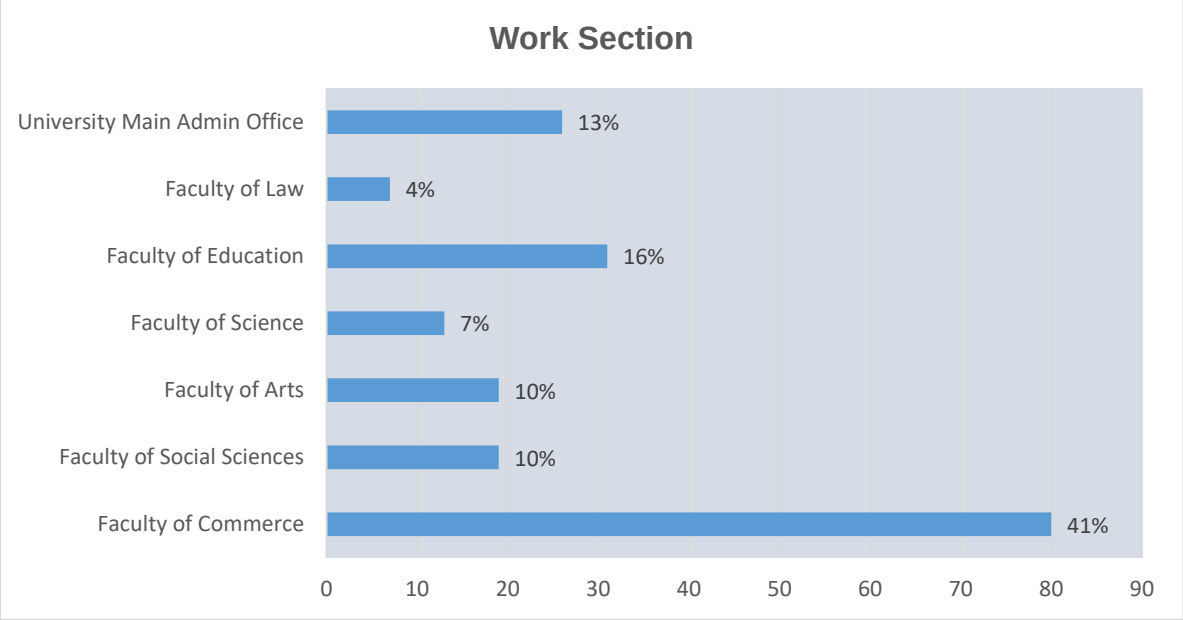


Figure 6.2: Respondents' work section

The majority of respondents (41%) were employed in the Faculty of Commerce, whilst 16% were employed in the faculty of education. The faculties of Social Sciences and Arts each employed 10% of the respondents, whilst the faculties of Science and Law

employed 7% and 4% of the respondents respectively. Of the total respondents, 13% were employed in the university main administration office.

Question 3 required respondents to indicate their qualifications. The results are depicted in figure 6.3 below.

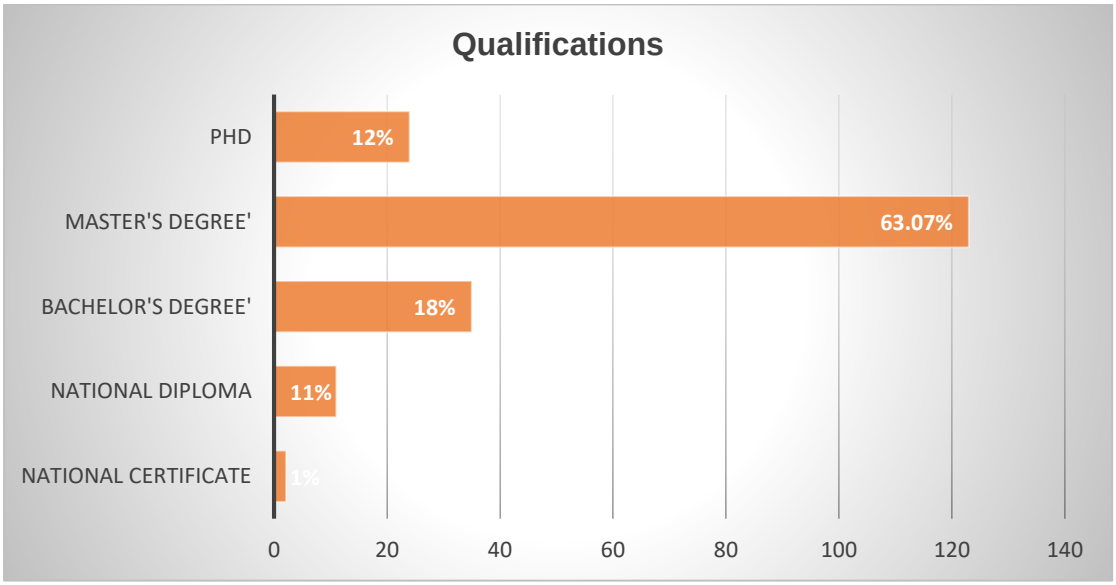


Figure 6.3: Qualification of respondents

The majority of the respondents (63.07%) indicated a master's level qualification. Of the 195 respondents, 18% indicated that they had a bachelor's degree. Figure 6.3 also shows that 12% of the respondents held a doctoral degree. Only 6% of the respondents held a national diploma, whilst 1% were national certificate holders.

In question 4 participants were requested to indicate their current position at GZU. Figure 6.4 below summarises the responses, indicating that the majority (46%) of the respondents were junior lecturers. Out of 195 respondents, 25% were senior lecturers and another 24% were administrators. Only 3% of the respondents were professors, whilst 2% were associate professors.

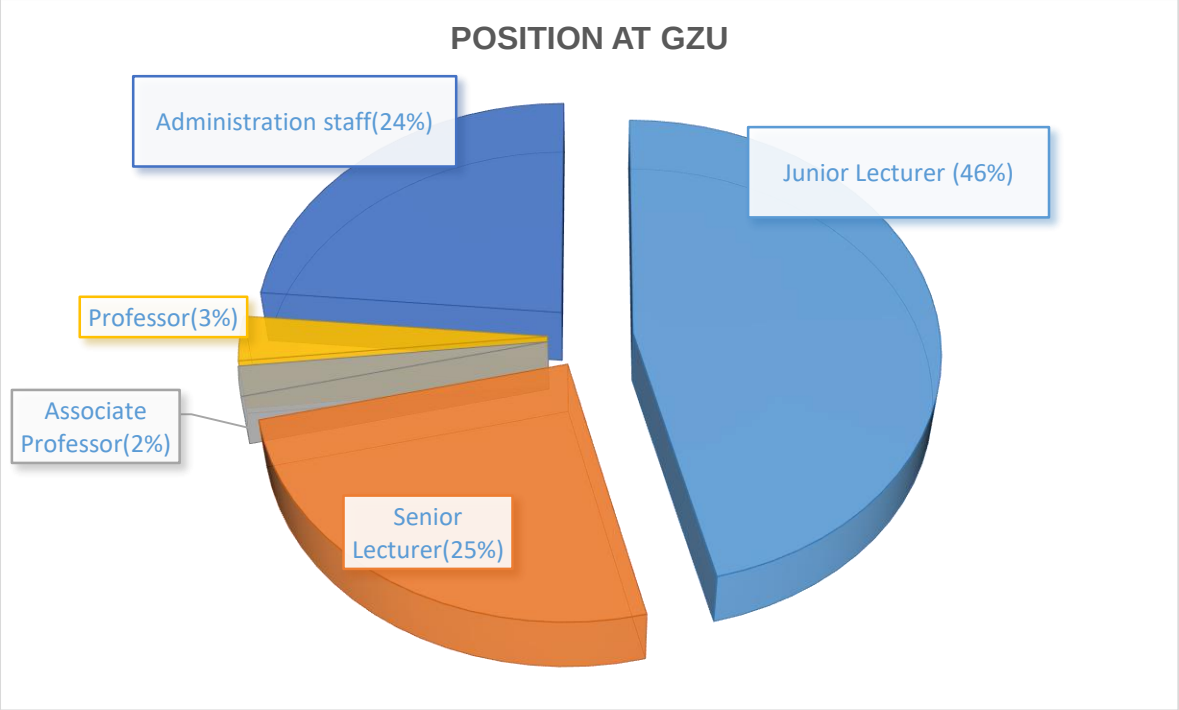


Figure 6.4: Respondents' positions at GZU

In question 5 respondents had to indicate their work experience. The responses are presented in figure 6.5 below.

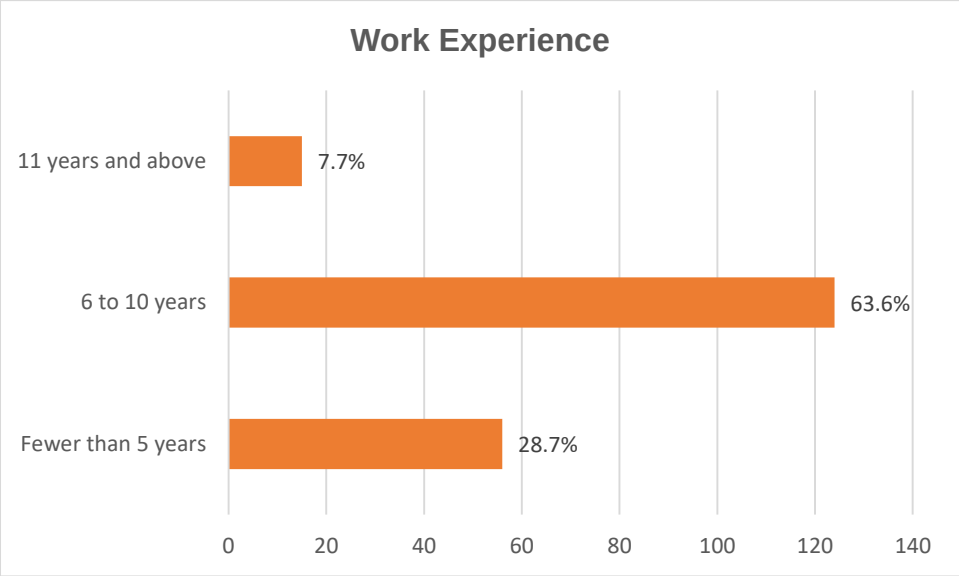


Figure 6.5: Respondents' work experience

According to figure 6.5 above, 63.6% of the respondents had been employed for a period ranging between 6 and 10 years. Of the 195 respondents, 28.7% had less than 5 years' employment, whilst 7.7% had been employed for over 11 years.

6.2.2 Organisational culture at GZU

This section deals with the respondents' perceptions about organisational culture at GZU as depicted by the CVF.

6.2.2.1 Research objective 1: The prevailing organisational culture at GZU

The perceptions of the respondents regarding the cultural types of GZU based on the CVF are presented in tables 6.1, 6.2, 6.3 and 6.4.

Table 6.1 below shows the frequencies for clan or group culture.

Table 6.1 Scores for clan culture

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
6.1	My supervisor is my mentor / friend	5.1%	2.1%	2.6%	19.0%	54.9%	16.4%	**195**
6.2	I am loyal to GZU	7.7%	4.6%	6.2%	21.5%	35.9%	24.1%	**195**
6.3	GZU values the development of people	12.3%	33.8%	7.7%	14.9%	19.5%	11.8%	**195**
6.4	I can discuss work-related problems with my supervisor	1.5%	5.1%	1.0%	17.9%	58.5%	15.9%	**195**
6.5	I can participate in making suggestions	2.6%	9.2%	3.1%	10.8%	53.3%	21.0%	**195**
6.6	My supervisor cares for my feelings	2.0%	11.0%	4.0%	11.0%	54.0%	18.0%	**195**
6.7	I am committed to GZU	3.6%	26.2%	1.5%	7.7%	35.9%	25.1%	**195**
6.8	I prefer to operate as part of a team	1.5%	1.5%	2.6%	4.1%	53.3%	36.9%	**195**

A total of 54.9% of the respondents (question 6.1) agreed that they had a good relationship with their supervisor. Of the 195 respondents, 35.9% (question 6.2) indicated that they were loyal to GZU. Some respondents (33.8%) disagreed (question 6.3) that GZU valued the development of people, and on question 6.4, 58.5% mentioned that they could discuss work-related problems with their supervisors. According to 53.3% of respondents, GZU allowed them to participate in making suggestions (question 6.5), whilst 54% agreed (question 6.6) that their supervisor cares for their feelings. A total of 35.9% stated that they were committed to the organisation (question

6.7), and the majority (53.3%) indicated in question 6.8 that they preferred to operate as part of a team.

Table 6.2: Scores for adhocracy culture

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
6.9	My supervisor makes innovative suggestions to better my performance	13.8%	16.4%	1.5%	27.2%	27.7%	13.3%	**195**
6.10	My supervisor is a risk-taker	14.9%	36.4%	7.2%	17.4%	17.9%	6.2%	**195**
6.11	I am given the opportunity to develop my skills	11.8%	38.5%	7.7%	11.8%	23.6%	6.7%	**195**
6.12	GZU is a market leader in innovation	13.8%	41.5%	8.7%	16.4%	14.9%	4.1%	**195**
6.13	I am able to make decisions on my own	6.2%	5.1%	6.2%	13.3%	55.4%	13.8%	**195**
6.14	I view GZU as a dynamic organisation that possesses the latest resources	32.8%	22.1%	9.2%	17.4%	16.9%	1.5%	**195**

According to table 6.2 above, 27.7% of the respondents (question 6.9) reported that their supervisor made innovative suggestions to enhance their performance. Some respondents (36.4%) (question 6.10) stated that their supervisors were not risk-takers, and another 38.5% (question 6.11) indicated that they are not given opportunities to develop their skills and creativity. Of the respondents, 41.5% (question 6.12) disagreed that GZU is a market leader in innovation, whilst 55.4% (question 6.13) stated that they were able to make decisions on their own when presented with an opportunity to do so. A total of 32.8% (question 6.14) of the respondents viewed GZU as an organisation that does not possess the latest resources.

Table 6.3: Scores for hierarchical culture

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
6.15	I know all the rules and regulations I am supposed to follow	1.5%	4.1%	1.5%	29.2%	53.3%	9.7%	**195**
6.16	I always follow the rules and regulations	3.6%	7.7%	3.1%	18.5%	58.5%	8.2%	**195**
6.17	My supervisor prefers to make all the decisions on procedures to follow	6.7%	11.8%	10.8%	22.6%	44.1%	4.1%	**195**
6.18	Every action is coordinated for the smooth running of the organisation	2.1%	8.2%	6.7%	24.6%	50.3%	8.2%	**195**
6.19	Everything must always be done according to plan	1.5%	8.2%	8.2%	24.6%	47.2%	10.3%	**195**

Table 6.3 shows that 53.3% of respondents (question 6.15) agreed that they knew the rules and regulations they are supposed to follow. A total of 58.5% (question 6.16) pointed out that they always follow the rules and regulations. Some respondents (44.1%) (question 6.17) stated that their supervisor preferred to make all the decisions on procedures to follow. Approximately half of the respondents, 50.3% (question 6.18), indicated that every action was coordinated for the smooth running of the organisation. According to 47.2% (question 6.19), everything must always be done according to plan.

Table 6.4: Scores for rational culture

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
6.20	My supervisor is focused on the task to be accomplished	2.1%	3.1%	9.2%	15.9%	55.4%	14.4%	**195**
6.21	I know what is expected of me with regard to my tasks	7.7%	1.5%	4.1%	13.8%	56.9%	15.9%	**195**
6.22	My supervisor sets clear goals	4.6%	8.7%	1.5%	32.8%	42.6%	9.7%	**195**
6.23	GZU is service and results oriented	10.8%	36.9%	7.2%	10.8%	21.0%	13.3%	**195**
6.24	I always strive to render the best possible service to students / other employees / suppliers	2.1%	1.0%	2.1%	7.7%	53.8%	33.3%	**195**

Table 6.4 reveals that slightly over half of the respondents (55.4%) (question 6.20) agreed that their supervisor is focused on accomplishing the task at hand, and 56.9% (question 6.21) knew what was expected of them with regard to their tasks. A total of

42.6% mentioned that their supervisors set clear goals, whilst 36.9% (question 6.23) disagreed that GZU was service or results oriented. A total of 53.8% (question 6.24) agreed that they always rendered the best possible service to students/other employees/suppliers.

6.2.2.2 Research objective 2: Levels of innovation at GZU

This section presents results pertaining to the level of innovation at GZU. The innovation construct was measured using the degree of employee creativity and empowerment, organisational constituency, organisational learning, innovation propensity and the implementation context. Table 6.5 below shows the responses regarding employee creativity and empowerment which measure the degree of empowerment and the creative capacity of GZU employees.

Table 6.5: Employee creativity and empowerment

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
7.1	I consider myself to be a creative/ innovative person	0.0%	4.6%	0.5%	0.0%	56.9%	37.9%	**195**
7.2	Innovation at GZU is more likely to succeed if employees are allowed to be unique	0.5%	0.5%	1.0%	5.6%	48.2%	44.1%	**195**
7.3	GZU uses my creativity to its benefit	12.8%	27.2%	10.8%	13.3%	27.7%	7.7%	**195**
7.4	I am given the opportunity to develop my creative potential	12.8%	30.8%	7.7%	11.3%	29.7%	7.7%	**195**

A total of 56.9% of the respondents (question 7.1) considered themselves to be creative or innovative people at GZU, whilst slightly less than half (48.2%) (question 7.2) indicated that innovation at GZU was likely to succeed if employees were allowed to be unique. A small number of respondents (27.7%) (question 7.3) felt that their creative abilities were being applied for the benefit of the institution. On the other hand, almost the same number of respondents (27.2%) (question 7.3) indicated that GZU was not benefiting from their creativity. Of the total respondents, 29.7% (question 7.4) mentioned that they were not given opportunities to develop their creative potential.

Table 6.6 below shows the responses regarding organisational constituency. This measures the degree to which GZU employees are engaged in the innovation imperative, as well as employees' perception of their contribution towards innovation vis-à-vis their colleagues' perception.

Table 6.6: Organisational constituency

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
7.5	I am connected to an innovation movement at GZU	13.8%	32.8%	16.9%	8.2%	22.6%	5.6%	**195**
7.6	There is trust and mutual respect between GZU management and employees	19.0%	36.9%	17.4%	5.6%	16.9%	4.1%	**195**
7.7	The employees in my area act as a team	7.2%	4.6%	10.3%	10.8%	47.2%	20.0%	**195**
7.8	At GZU communication is open and honest	19.0%	35.9%	21.5%	10.3%	11.3%	2.1%	**195**
7.9	GZU has an effective environment for collaboration within and between departments	12.8%	29.2%	24.1%	12.3%	16.9%	4.6%	**195**

According to table 6.6 above, 32.8% of the respondents (question 7.5) indicated that they were not connected to an innovation movement at GZU, whilst 36.9% (question 7.6) indicated a lack of trust and mutual respect between GZU management and its employees. Some respondents (47.2%) (question 7.7) confirmed that employees in their department prefer to work as teams. A total of 35.9% (question 7.8) reported that communication at GZU is not open and honest, whilst some respondents (29.2%) (question 7.9) believed that GZU does not offer an effective environment for collaboration amongst departments.

Table 6.7 below shows the responses regarding organisational learning which measure the degree to which the training and educational opportunities of GZU employees are aligned with innovation objectives.

Table 6.7: Organisational learning

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
7.10	There is innovation mentorship at GZU	21.5%	36.4%	5.6%	14.4%	16.9%	5.1%	**195**
7.11	GZU management possesses the appropriate leadership qualities to support innovation	12.3%	46.2%	7.7%	11.3%	17.9%	4.6%	**195**
7.12	Everyone in our organisation is involved in learning (training) to be innovative	14.9%	46.7%	4.6%	11.8%	16.9%	5.1%	**195**
7.13	I know the training/ learning needs I have engaged myself in to support innovation	3.6%	10.3%	1.5%	12.8%	51.3%	20.5%	**195**

Table 6.7 shows that some respondents (36.4%) (question 7.10) disagreed with the assertion that there is innovation mentorship at GZU, whilst 46.2% (question 7.11) indicated that GZU management does not possess that appropriate leadership qualities to support innovation. Close to half of the respondents (46.7%) (question 7.12) mentioned that employees at GZU are not involved in training to be innovative. Slightly over half of the respondents (51.3%) (question 7.13) agreed that they know the training needs they have to engage themselves in to support innovation.

Table 6.8 below shows the responses regarding innovation propensity which measure the degree to which GZU has a formally established architecture such as goals, vision and business models to develop and sustain innovation.

Table 6.8: Innovation propensity

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
7.14	Innovation is an underlying culture and not just a word at GZU	22.6%	33.3%	10.8%	12.8%	15.4%	5.1%	**195**
7.15	The GZU operating model is premised on innovation strategic intent	14.4%	41.0%	9.7%	13.3%	17.4%	4.1%	**195**
7.16	At GZU there is a coherent set of innovation goals and objectives that have been well articulated	11.3%	44.1%	14.4%	11.3%	14.4%	4.6%	**195**
7.17	At GZU employees meet about and discuss innovation	12.3%	41.0%	16.9%	10.8%	15.4%	3.6%	**195**

According to table 6.8 above, 33.3% of the respondents (question 7.14) disagreed with the notion that innovation is an underlying culture at GZU. A total of 41.0% (question 7.15) were of the opinion that the GZU operating model is not premised on innovation strategic intent. Less than half of the respondents (44.1%) (question 7.16) reported that the GZU does not have a coherent set of well-articulated innovation goals and objectives, whilst 41% (question 7.17) mentioned that GZU employees do not meet to discuss innovation ideas.

Table 6.9 below shows the responses regarding innovation implementation context which measure the degree at which GZU is able to execute value-added ideas and to proactively align with a changing environment.

Table 6.9: Implementation context

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
7.18	GZU has a wide resource base as it relates to innovation	10.3%	52.3%	13.8%	7.7%	14.4%	1.5%	**195**
7.19	GZU has a good record of rolling out innovations	9.2%	53.3%	11.3%	11.8%	12.3%	2.1%	**195**
7.20	At GZU ideas flow smoothly through to commercialisation	10.3%	49.7%	13.3%	13.3%	12.3%	1.0%	**195**
7.22	GZU management helps break down barriers that stand in the way of innovation	10.8%	42.9%	11.8%	13.8%	11.8%	2.6%	**195**
7.23	GZU has metrics to measure the effectiveness of its innovation initiatives	10.8%	48.7%	10.8%	11.3%	14.4%	4.1%	**195**

According to table 6.9, the majority of the respondents (52.3%) (question 7.18) indicated that GZU does not have a wide resource base to support innovative activities. Another 53.3% (question 7.19) disagreed that GZU has a good record of rolling out innovations. Nearly half of the respondents (49.7%) (question 7.20) disagreed that ideas flow smoothly through to commercialisation at GZU. Another 49.2% (question 7.21) did not believe that GZU management helps to break down barriers that stand in the way of innovation implementation, whilst 48.7% (question 7.22) concurred that GZU does not have metrics to measure the effectiveness of its innovation initiatives.

6.2.2.3 Research objective 3: Levels of knowledge sharing at GZU

Knowledge sharing was analysed using the following sub variables: subjective norms, self-efficacy, organisational support, attitude to knowledge sharing, and intention to share knowledge. Table 6.10 below displays the frequencies pertaining to questions on subjective norms. This sub variable measures the thinking of colleagues regarding their own knowledge-sharing behaviour.

Table 6.10: Subjective norms

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
8.1	People who influence my behaviour (colleagues, friends, family, etc.) think that I should share my knowledge	5.6%	9.2%	2.6%	11.8%	55.9%	14.9%	**195**
8.2	I respect and put into practice the decisions from my colleagues, friends and family regarding knowledge sharing	8.7%	4.1%	1.5%	5.6%	61.0%	19.0%	**195**

The majority of the respondents (55.9%) agreed (question 8.1) that people who influence their behaviour think that they should share their knowledge, whilst a significant percentage (61%) (question 8.2) respect and put into practice the decisions from their colleagues and family regarding knowledge sharing.

Table 6.11 below shows frequencies pertaining to questions on self-efficacy which measure the level of an individual's self-appraisal regarding knowledge sharing.

Table 6.11: Self-efficacy

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
8.3	Sharing my knowledge would help other members at GZU solve problems	8.7%	4.1%	1.5%	5.6%	61.0%	19.0%	**195**
8.4	Sharing my knowledge would create new opportunities for GZU	4.6%	8.7%	1.5%	6.7%	57.9%	20.5%	**195**
8.5	Sharing my knowledge would improve work processes at GZU	4.6%	7.7%	2.6%	6.7%	61.5%	16.9%	**195**
8.6	My knowledge sharing would help GZU achieve its goals	5.1%	7.2%	4.6%	5.1%	59.0%	19.0%	**195**

Table 6.11 above shows that most of the respondents believe in themselves and the knowledge that they possess. A total of 61% (question 8.3) agreed that sharing knowledge would help other members at GZU to solve problems. Not only that, another 57.9% (question 8.4) reported that sharing their knowledge would create new opportunities for the university. The majority of respondents (61.5%) (question 8.5) thought that sharing knowledge would improve work processes at GZU, whilst 59% agreed (question 8.6) that their knowledge can help GZU achieve its goals.

Table 6.12 below shows the frequencies pertaining to questions on organisational support which measures the degree to which an organisation has appropriate resources to support knowledge sharing.

Table 6.12: Organisational support

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
8.7	GZU has appropriate technology in place (e.g., academic portal, website, email) to support knowledge sharing	6.7%	13.8%	3.1%	18.5%	48.2%	9.7%	**195**
8.8	GZU has processes in place (e.g., meeting, colloquium, intellectual discourse session) for knowledge sharing	16.4%	37.9%	4.1%	10.3%	25.6%	5.6%	**195**
8.9	GZU supports the formation of networks (e.g., community of practice) where knowledge sharing takes place	11.8%	38.5%	6.2%	14.9%	21.5%	7.2%	**195**

Table 6.12 shows that 48.2% of the respondents (question 8.7) reported that GZU has appropriate technology (such as an academic portal, website and email) in place to support knowledge sharing. However, 37.9% disagreed (question 8.8) that GZU has sufficient processes (such as meetings, colloquiums and intellectual discourse sessions) in place for knowledge sharing. Some respondents (40%) mentioned (question 8.9) that GZU does not support the formation of networks such as communities of practice to enhance knowledge sharing.

Table 6.13 below shows the frequencies pertaining to questions on attitude towards knowledge sharing which measure the feelings of individuals towards knowledge sharing or the evaluation of the knowledge-sharing activities.

Table 6.13 Attitude towards knowledge sharing

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
8.10	I like sharing knowledge with other GZU members	7.2%	5.1%	2.1%	11.3%	54.9%	19.5%	**195**
8.11	Sharing my knowledge with other GZU members adds value to me	7.2%	2.6%	2.6%	11.8%	49.7%	26.2%	**195**
8.12	Sharing my knowledge with other GZU members is a wise move	7.2%	3.1%	2.6%	10.3%	51.3%	25.6%	**195**

According to table 6.13, a significant percentage of the respondents (54.9%) (question 8.10) like to share knowledge with other GZU members, whilst 49.7% (question 8.11) thought that sharing knowledge with other GZU members adds value to themselves. Slightly over half (51.3%) of the respondents (question 8.12) agreed that sharing knowledge with other GZU members is a wise move.

Table 6.14 below shows the frequencies pertaining to questions on the intention to share knowledge.

Table 6.14: Intention to share knowledge

Q		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	N
8.13	I intend sharing my knowledge with other GZU members more frequently	4.1%	3.1%	6.2%	10.8%	49.7%	26.2%	195
8.14	I will share my knowledge with anyone at GZU if it is applicable to work matters	3.1%	3.1%	1.5%	11.3%	47.2%	33.8%	195

It is clear from table 6.14 that 49.7% of the respondents (question 8.13) intended to share knowledge with other GZU members more frequently, whilst slightly less than half (47.2%) (question 8.14) agreed that they would share knowledge with anyone at GZU if it is applicable to work matters.

6.3 Structural equation modelling (research objectives 4, 5 and 6)

As all the data variables significantly deviated from a normal distribution, the use of PLS-SEM was validated (see table 6.16). Moreover, PLS-SEM is a second-generation multivariate technique capable of simultaneously assessing the model of measurement (the relationships shared between constructs and their corresponding indicators) and the structural model along with the objective of reducing the error variance (Abdi, Mardani, Senin, Tupeniate, Naimaviciene, Kanapeckiene, & Kutut, 2018). PLS-SEM is also suitable when the study aims to predict key target constructs and the research is exploratory in nature (Hair, Hult, Ringle, & Sarstedt, 2017).

Another consideration for using PLS-SEM in the study was the fact that the minimum sample size required to conduct the analysis was relatively low. The minimum sample size for PLS-SEM should be equal to the larger of the following: (1) ten times the largest number of formative indicators used to measure one construct or (2) ten times the largest number of structural paths directed at a particular construct in the structural model. The minimum required sample size for the PLS-SEM analysis was 20. Therefore, the sample size used in the study (n=195) far exceeded the minimum requirement. Table 6.15 details the indicators and their abbreviations applicable to the data analysis.

Table 6.15: Indicators and abbreviations used in the data analysis

Attitude towards knowledge sharing	KS-AT
Intention to share knowledge	KS-IN
Organisational support	KS-OS
Self-efficacy	KS-SE
Subjective norms	KS-SN
Adhocracy culture (developmental culture)	CUL-DC
Clan culture (group culture)	CUL-GC
Hierarchical culture	CUL-HC
Rational culture	CUL-RC
Employee creativity and empowerment	IN-ECE
Implementation context	IN-IC
Innovation propensity	IN-IP
Organisational constituency	IN-OC
Organisational learning	IN-OL
Organisational culture	CUL
Innovation	IN
Knowledge sharing	KS

Table 6.15 above shows the following:

- Organisational culture was measured using four indicators (adhocracy culture, clan culture, hierarchical culture and rational culture).
- Innovation was measured using five indicators (implementation context, employee creativity and empowerment, organisational constituency, organisational learning, and innovation propensity).
- Knowledge sharing was measured using five indicators (subjective norms, self-efficacy, organisational support, attitude towards knowledge sharing, and intention to share knowledge).

As indicated in table 6.16 below, all data variables significantly deviated from a normal distribution as their p-values were less than 0.05. Hence PLS-SEM was used to analyse the data (Laerd Statistics, 2019).

Table 6.16: Shapiro-Wilk Test

	Shapiro-Wilk		
	Statistic	df	Sig.
CUL-DC-01	0.874	191	<0.001
CUL-DC-02	0.878	191	<0.001
CUL-DC-03	0.859	191	<0.001
CUL-DC-04	0.867	191	<0.001
CUL-DC-05	0.772	191	<0.001
CUL-DC-06	0.849	191	<0.001
CUL-GC-01	0.744	191	<0.001
CUL-GC-02	0.841	191	<0.001
CUL-GC-03	0.879	191	<0.001
CUL-GC-04	0.722	191	<0.001
CUL-GC-05	0.754	191	<0.001
CUL-GC-06	0.767	191	<0.001
CUL-GC-07	0.815	191	<0.001
CUL-GC-08	0.686	191	<0.001
CUL-HC-01	0.773	191	<0.001
CUL-HC-02	0.748	191	<0.001
CUL-HC-03	0.845	191	<0.001
CUL-HC-04	0.818	191	<0.001
CUL-HC-05	0.845	191	<0.001
CUL-RC-01	0.801	191	<0.001
CUL-RC-02	0.727	191	<0.001
CUL-RC-03	0.823	191	<0.001

CUL-RC-04	0.860	191	<0.001
CUL-RC-05	0.706	191	<0.001
IN-ECE-01	0.622	191	<0.001
IN-ECE-02	0.715	191	<0.001
IN-ECE-03	0.887	191	<0.001
IN-ECE-04	0.865	191	<0.001
IN-IC-01	0.805	191	<0.001
IN-IC-02	0.807	191	<0.001
IN-IC-03	0.832	191	<0.001
IN-IC-04	0.839	191	<0.001
IN-IC-05	0.829	191	<0.001
IN-IP-01	0.866	191	<0.001
IN-IP-02	0.863	191	<0.001
IN-IP-03	0.852	191	<0.001
IN-IP-04	0.867	191	<0.001
IN-OC-01	0.881	191	<0.001
IN-OC-02	0.859	191	<0.001
IN-OC-03	0.806	191	<0.001
IN-OC-04	0.883	191	<0.001
IN-OC-05	0.911	191	<0.001
IN-OL-01	0.854	191	<0.001
IN-OL-02	0.834	191	<0.001
IN-OL-03	0.828	191	<0.001
IN-OL-04	0.775	191	<0.001
KS-AT-01	0.732	191	<0.001
KS-AT-02	0.735	191	<0.001
KS-AT-03	0.728	191	<0.001
KS-IN-01	0.771	191	<0.001
KS-IN-02	0.733	191	<0.001
KS-OS-01	0.809	191	<0.001
KS-OS-02	0.844	191	<0.001
KS-OS-03	0.863	191	<0.001
KS-SE-01	0.674	191	<0.001
KS-SE-02	0.717	191	<0.001
KS-SE-03	0.704	191	<0.001
KS-SE-04	0.723	191	<0.001
KS-SN-01	0.757	191	<0.001
KS-SN-02	0.751	191	<0.001

6.3.1 Assessing the outer model

When applying the PLS-SEM, researchers need to follow a multistage process. This process involves the model specification, outer and inner model specification, data collection and examination, the actual model estimation, and the evaluation of results (Hair, Sarsted, Hopkins, & Kupperlwieser, 2016).

The integrated model that was tested using the PLS-SEM is indicated below:

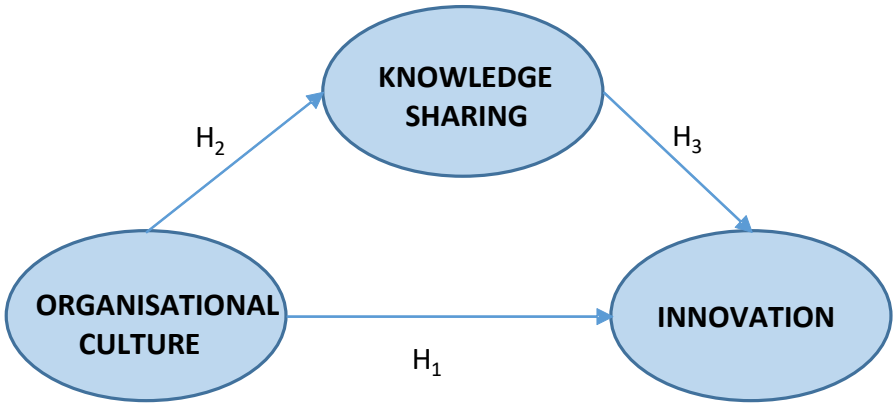


Figure 6.6: Research model

The hypothesis for the research model was as follows:

H_1: Organisational culture will positively influence innovation.
H_2: Organisational culture will positively influence knowledge sharing.
H_3: Knowledge sharing will positively influence innovation.

Validity and reliability

Before testing for a significant relationship in the structural model, the researcher must demonstrate that the measurement model has a satisfactory level of validity and reliability (Valmohammadi & Roshanzamir, 2015). In the current study, validity and reliability were confirmed using indicator reliability, convergent reliability, internal consistency reliability and discriminant validity coefficients. These are explained below.

Indicator reliability: According to Hulland (1999), reflective indicator loadings of >0.5 show that the item is a good measurement of a latent construct. Hair *et al.* (2017) further suggested that the indicator's outer loadings should be higher than 0.70 and that indicators with outer loadings between 0.40 and 0.70 should be considered for removal only if the deletion leads to an increase in composite reliability and an average variance extracted (AVE) above the suggested threshold value. Based on guidelines provided by

Hulland (1999) and Hair *et al.* (2017) the following measurement items were removed: {CUL-DC-05, CUL-HC-03, IN-ECE-01, IN-ECE-02, IN-OC-03, IN-OL-05, and IN-OL-04} and {CUL-GC-01, CUL-GC-03, CUL-GC-04, and IN-OC-05}.

Table 6.17 and 6.18 show that all indicator loadings are above the 0.5 threshold prescribed by Hulland (1999). Furthermore, all indicator loadings exceeded the 0.7 threshold prescribed by Hair *et al*. (2017), except the following four items with loadings greater than 0.65 but smaller than 0.7 {CUL-GC-07, CUL-HC-02, CUL-RC-01, and CUL-RC-04}.

Convergent reliability: Convergent reliability is the extent to which a measure correlates positively with alternative measures of the same construct (Hair *et al*., 2017). Convergent reliability is assessed using the AVE. The AVE should be greater than 0.5 (see Bagozzi, 1986; Hair *et al.*, 2016).

Table 6.17 shows that the AVE of all items in the measurement model of first-order constructs is above the 0.5 threshold, indicating a good convergent reliability of the first-order latent variables. According to table 6.18, the AVE of all items in the measurement model of second-order constructs is above the 0.5 threshold, except organisational culture which is 0.322. This is because the measurement of organisational culture consists of four competing culture quadrants (clan, adhocracy, hierarchical and rational); hence, these four culture measures might not have the same high positive correlation as the innovation and knowledge sharing second-order constructs used in the study.

Internal consistency reliability: Internal consistency reliability can be assessed using composite reliability (CR) and Cronbach's alpha (α). According to Gefen, Straub, and Boudreau (2000), a CR value greater than 0.7 indicates adequate internal consistency reliability. Hair *et al*. (2017) suggested that Cronbach alpha (α) values of between 0.60 and 0.70 are widely considered desirable in research to indicate internal consistency reliability.

Tables 6.17 and 6.18 below show that the CR of all items was above 0.7, and α of all items was above 0.6, therefore indicating internal consistency reliability.

Table 6.17: Measurement of first-order variables

Latent variables	Items	Loadings	AVE	CR	α
CUL-DC	CUL-DC-01	0.722	0.661	0.907	0.87
	CUL-DC-02	0.839			
	CUL-DC-03	0.788			
	CUL-DC-04	0.858			
	CUL-DC-06	0.849			
CUL-GC	CUL-GC-02	0.706	0.551	0.859	0.793
	CUL-GC-05	0.722			
	CUL-GC-06	0.768			
	CUL-GC-07	0.653			
	CUL-GC-08	0.847			
CUL-HC	CUL-HC-01	0.793	0.506	0.802	0.676
	CUL-HC-02	0.681			
	CUL-HC-04	0.756			
	CUL-HC-05	0.599			
CUL-RC	CUL-RC-01	0.680	0.540	0.824	0.714
	CUL-RC-02	0.779			
	CUL-RC-03	0.812			
	CUL-RC-04	0.658			
IN-ECE	IN-ECE-03	0.901	0.826	0.905	0.790
	IN-ECE-04	0.917			
IN-IC	IN-IC-01	0.869	0.778	0.946	0.929
	IN-IC-02	0.922			
	IN-IC-03	0.874			
	IN-IC-04	0.891			
	IN-IC-05	0.853			
IN-IP	IN-IP-01	0.912	0.833	0.952	0.933
	IN-IP-02	0.947			
	IN-IP-03	0.918			
	IN-IP-04	0.872			
IN-OC	IN-OC-01	0.830	0.711	0.881	0.796
	IN-OC-02	0.879			
	IN-OC-04	0.820			
IN-OL	IN-OL-01	0.914	0.855	0.947	0.915
	IN-OL-02	0.954			
	IN-OL-03	0.906			
KS-AT	KS-AT-01	0.966	0.951	0.983	0.974
	KS-AT-02	0.982			
	KS-AT-03	0.976			
KS-IN	KS-IN-01	0.949	0.854	0.921	0.834
	KS-IN-02	0.899			
KS-OS	KS-OS-01	0.691	0.605	0.820	0.668
	KS-OS-02	0.880			
	KS-OS-03	0.751			

KS-SE	KS-SE-01	0.945	0.911	0.976	0.967
	KS-SE-02	0.967			
	KS-SE-03	0.958			
	KS-SE-04	0.947			
KS-SN	KS-SN-01	0.951	0.911	0.954	0.903
	KS-SN-02	0.958			

Table 6.18: Measurement model: Second-order latent variables

Latent variables	Items	Loadings	AVE	CR	α
Organisational culture	CUL-GC	0.832	0.322	0.916	0.904
	CUL-DC	0.781			
	CUL-HC	0.725			
	CUL-RC	0.846			
Innovation	IN-IC	0.888	0.507	0.953	0.964
	IN-ECE	0.676			
	IN-OC	0.861			
	IN-OL	0.917			
	IN-IP	0.919			
Knowledge sharing	KS-SN	0.846	0.606	0.954	0.945
	KS-SE	0.917			
	KS-OS	0.669			
	KS-AT	0.893			
	KS-IN	0.788			

Discriminant validity: Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards (Hair *et al.*, 2016). According to Hair *et al*. (2017), discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model. This study used the cross loadings, namely the Fornell-Larcker criterion and heterotrait–monotrait ratio (HTMT), to assess the discriminant validity of the measurement model. The cross loadings will be discussed below.

Cross loadings

The cross loadings are typically the first approach to assessing the discriminant validity of the indicators. Specifically, an indicator's outer loading on the associated construct should be greater than any of its cross loadings (i.e., its correlation) on other constructs (Hair *et al.*, 2016). The best way to assess and report cross loadings is in a table with rows for the indicators and columns for the latent variables, as shown in table 6.19. From table 6.19 it can be noted that the indicator loadings of each construct do not load higher on any other construct, which indicates discriminant validity.

Table 6.19: Cross loadings

	CUL-DC	CUL-GC	CUL-HC	CUL-RC	IN-ECE	IN-IC	IN-IP	IN-OC	IN-OL	KS-AT	KS-IN	KS-OS	KS-SE	KS-SN
CUL-DC-01	**0.722**	0.443	0.349	0.472	0.341	0.45	0.603	0.529	0.574	0.48	0.27	0.504	0.37	0.381
CUL-DC-02	**0.839**	0.353	0.163	0.438	0.521	0.491	0.608	0.503	0.638	0.229	0.077	0.443	0.262	0.201
CUL-DC-03	**0.788**	0.372	0.193	0.455	0.437	0.401	0.542	0.428	0.511	0.25	0.099	0.403	0.219	0.126
CUL-DC-04	**0.858**	0.42	0.297	0.526	0.494	0.562	0.726	0.606	0.697	0.303	0.143	0.563	0.348	0.288
CUL-DC-06	**0.849**	0.389	0.192	0.497	0.518	0.699	0.741	0.627	0.747	0.245	0.116	0.591	0.207	0.136
CUL-GC-02	0.566	**0.706**	0.37	0.424	0.258	0.318	0.415	0.433	0.453	0.442	0.211	0.384	0.355	0.321
CUL-GC-05	0.155	**0.722**	0.58	0.373	0.159	0.076	0.128	0.197	0.137	0.123	0.142	0.096	0.143	0.209
CUL-GC-06	0.282	**0.768**	0.568	0.494	0.333	0.134	0.22	0.34	0.251	0.119	0.057	0.147	0.083	0.14
CUL-GC-07	0.45	**0.653**	0.087	0.385	0.484	0.368	0.401	0.45	0.42	0.052	0.091	0.314	-0.003	0.034
CUL-GC-08	0.353	**0.847**	0.526	0.54	0.307	0.214	0.251	0.337	0.326	0.218	0.147	0.237	0.186	0.189
CUL-HC-01	0.189	0.515	**0.793**	0.419	0.006	0.136	0.174	0.215	0.147	0.228	0.171	0.17	0.26	0.347
CUL-HC-02	0.314	0.453	**0.681**	0.647	0.311	0.155	0.19	0.189	0.277	0.166	0.052	0.23	0.146	0.033
CUL-HC-04	0.203	0.397	**0.756**	0.347	0.076	0.045	0.187	0.242	0.173	0.162	0.143	0.107	0.132	0.221
CUL-HC-05	0.1	0.257	**0.599**	0.26	-0.081	0.055	0.178	0.125	0.149	0.151	0.171	0.082	0.158	0.228
CUL-RC-01	0.422	0.606	0.614	**0.68**	0.246	0.21	0.323	0.395	0.316	0.319	0.131	0.291	0.274	0.289
CUL-RC-02	0.368	0.411	0.504	**0.779**	0.33	0.139	0.27	0.213	0.276	0.238	0.165	0.292	0.28	0.127
CUL-RC-03	0.411	0.399	0.427	**0.812**	0.626	0.327	0.37	0.406	0.409	0.062	0.066	0.391	0.046	-0.043
CUL-RC-04	0.535	0.309	0.203	**0.658**	0.585	0.48	0.595	0.506	0.544	0.076	0.234	0.517	0.163	0.134
IN-ECE-03	0.493	0.388	0.108	0.553	**0.901**	0.429	0.456	0.546	0.515	0.003	0.087	0.381	0.029	-0.041
IN-ECE-04	0.54	0.356	0.138	0.532	**0.917**	0.476	0.541	0.603	0.517	-0.033	0.027	0.402	0.004	-0.058
IN-IC-01	0.557	0.242	0.127	0.323	0.412	**0.869**	0.691	0.562	0.622	0.149	0.104	0.535	0.162	0.168
IN-IC-02	0.564	0.249	0.103	0.374	0.444	**0.922**	0.673	0.602	0.663	0.211	0.151	0.575	0.218	0.235
IN-IC-03	0.551	0.208	0.067	0.344	0.44	**0.874**	0.627	0.535	0.603	0.17	0.163	0.509	0.193	0.217
IN-IC-04	0.583	0.28	0.178	0.337	0.459	**0.891**	0.675	0.649	0.721	0.164	0.146	0.531	0.177	0.215
IN-IC-05	0.588	0.32	0.161	0.328	0.445	**0.853**	0.703	0.616	0.684	0.116	0.051	0.483	0.143	0.167
IN-IP-01	0.777	0.319	0.238	0.517	0.518	0.687	**0.912**	0.647	0.748	0.266	0.063	0.618	0.28	0.212
IN-IP-02	0.781	0.378	0.253	0.46	0.484	0.715	**0.947**	0.707	0.755	0.289	0.116	0.623	0.305	0.26
IN-IP-03	0.685	0.38	0.261	0.511	0.505	0.701	**0.918**	0.706	0.754	0.218	0.177	0.619	0.26	0.289
IN-IP-04	0.666	0.305	0.176	0.423	0.503	0.687	**0.872**	0.628	0.691	0.116	0.15	0.487	0.237	0.254
IN-OC-01	0.583	0.478	0.203	0.433	0.554	0.571	0.641	**0.83**	0.595	0.165	0.111	0.412	0.09	0.099
IN-OC-02	0.524	0.498	0.316	0.409	0.447	0.547	0.608	**0.879**	0.66	0.154	0.072	0.471	0.064	0.141
IN-OC-04	0.581	0.226	0.182	0.467	0.596	0.584	0.615	**0.82**	0.687	0.158	0.136	0.502	0.17	0.161
IN-OL-01	0.725	0.345	0.213	0.461	0.537	0.714	0.705	0.705	**0.914**	0.214	0.11	0.618	0.183	0.178
IN-OL-02	0.755	0.462	0.279	0.527	0.537	0.736	0.799	0.76	**0.954**	0.287	0.172	0.658	0.26	0.257
IN-OL-03	0.692	0.378	0.25	0.454	0.501	0.621	0.736	0.667	**0.906**	0.281	0.17	0.55	0.268	0.258
KS-AT-01	0.38	0.306	0.304	0.277	-0.038	0.158	0.244	0.185	0.291	**0.966**	0.722	0.538	0.694	0.616
KS-AT-02	0.368	0.25	0.232	0.255	0.007	0.201	0.248	0.191	0.271	**0.982**	0.768	0.579	0.705	0.618
KS-AT-03	0.348	0.231	0.198	0.193	-0.021	0.178	0.223	0.176	0.262	**0.976**	0.763	0.538	0.674	0.588
KS-IN-01	0.235	0.19	0.186	0.196	0.013	0.151	0.156	0.137	0.189	0.824	**0.949**	0.484	0.64	0.621
KS-IN-02	0.064	0.129	0.142	0.17	0.118	0.099	0.091	0.09	0.1	0.563	**0.899**	0.315	0.424	0.414
KS-OS-01	0.168	0.223	0.308	0.263	0.044	0.271	0.258	0.217	0.28	0.474	0.422	**0.691**	0.409	0.445
KS-OS-02	0.654	0.27	0.122	0.453	0.501	0.574	0.63	0.52	0.639	0.414	0.311	**0.88**	0.444	0.378
KS-OS-03	0.661	0.248	0.053	0.467	0.492	0.566	0.641	0.571	0.643	0.426	0.293	**0.751**	0.282	0.166
KS-SE-01	0.381	0.21	0.252	0.256	0.032	0.19	0.3	0.146	0.27	0.724	0.572	0.509	**0.945**	0.798
KS-SE-02	0.336	0.209	0.225	0.252	0.009	0.186	0.285	0.109	0.247	0.696	0.599	0.459	**0.967**	0.787
KS-SE-03	0.306	0.19	0.233	0.243	0.008	0.196	0.277	0.115	0.225	0.639	0.531	0.464	**0.958**	0.801
KS-SE-04	0.31	0.218	0.228	0.263	0.02	0.201	0.273	0.124	0.235	0.643	0.556	0.467	**0.947**	0.811
KS-SN-01	0.263	0.209	0.282	0.156	-0.072	0.229	0.27	0.165	0.261	0.57	0.521	0.401	0.763	**0.951**
KS-SN-02	0.276	0.263	0.258	0.192	-0.034	0.206	0.262	0.141	0.218	0.618	0.577	0.44	0.834	**0.958**

The Fornell-Larcker criterion is the second approach to assessing discriminant validity. It compares the square root of the AVE values with the latent variable correlations. The AVE of each construct should be higher than the highest squared correlation with any other construct (Hair *et al.,* 2016). The square root of the AVE of each latent variable is shown diagonally in bold in table 6.20 along with the correlations of the latent variable with other latent variables. Table 6.20 indicates that the square root of the AVE of each latent variable is indeed higher than any correlation with any other latent variable, thus indicating the discriminant validity of the measurement model.

Table 6.20: Fornell-Larcker criterion

	CUL-DC	CUL-GC	CUL-HC	CUL-RC	IN-ECE	IN-IC	IN-IP	IN-OC	IN-OL	KS-AT	KS-IN	KS-OS	KS-SE	KS-SN
CUL-DC	**0.813**													
CUL-GC	0.489	**0.742**												
CUL-HC	0.298	0.588	**0.711**											
CUL-RC	0.591	0.603	0.614	**0.735**										
IN-ECE	0.569	0.409	0.136	0.596	**0.909**									
IN-IC	0.645	0.296	0.145	0.387	0.499	**0.882**								
IN-IP	0.798	0.379	0.255	0.524	0.55	0.765	**0.912**							
IN-OC	0.668	0.472	0.276	0.518	0.633	0.674	0.737	**0.843**						
IN-OL	0.784	0.429	0.268	0.521	0.568	0.748	0.808	0.77	**0.925**					
KS-AT	0.375	0.269	0.251	0.248	-0.017	0.184	0.245	0.189	0.282	**0.975**				
KS-IN	0.176	0.177	0.18	0.2	0.062	0.139	0.138	0.126	0.163	0.77	**0.924**			
KS-OS	0.621	0.318	0.218	0.502	0.431	0.597	0.645	0.549	0.66	0.566	0.445	**0.778**		
KS-SE	0.35	0.217	0.246	0.266	0.018	0.202	0.297	0.129	0.256	0.709	0.592	0.498	**0.954**	
KS-SN	0.283	0.248	0.282	0.183	-0.055	0.227	0.278	0.159	0.25	0.623	0.576	0.441	0.837	**0.955**

The last and most reliable method of assessing discriminant validity is the HTMT of the correlations. This ratio is the mean of all correlations of indicators across constructs measuring different constructs (i.e., the heterotrait–heteromethod correlations) relative to the (geometric) mean of the average correlations of indicators measuring the same construct (i.e., the monotrait–heteromethod correlations) (Hair *et al*., 2017). Acceptable values of the HTMT ratio should not exceed 0.9 (Hair *et al*., 2017). As can be noted from table 6.21, all HTMT ratios were less than 0.9, indicating that the measurement model exhibits discriminant validity.

Table 6.21: HTMT ratios

	CUL-DC	CUL-GC	CUL-HC	CUL-RC	IN-ECE	IN-IC	IN-IP	IN-OC	IN-OL	KS-AT	KS-IN	KS-OS	KS-SE
CUL-DC													
CUL-GC	0.586												
CUL-HC	0.368	0.763											
CUL-RC	0.749	0.777	0.82										
IN-ECE	0.686	0.527	0.236	0.812									
IN-IC	0.713	0.349	0.177	0.484	0.581								
IN-IP	0.881	0.444	0.322	0.651	0.64	0.822							
IN-OC	0.797	0.602	0.37	0.686	0.795	0.781	0.855						
IN-OL	0.874	0.502	0.333	0.651	0.668	0.809	0.874	0.899					
KS-AT	0.404	0.293	0.306	0.284	0.025	0.193	0.255	0.214	0.298				
KS-IN	0.195	0.21	0.248	0.262	0.096	0.154	0.153	0.15	0.178	0.831			
KS-OS	0.834	0.441	0.342	0.747	0.613	0.77	0.832	0.769	0.858	0.7	0.572		
KS-SE	0.377	0.243	0.302	0.313	0.028	0.214	0.313	0.146	0.272	0.729	0.639	0.607	
KS-SN	0.314	0.289	0.374	0.251	0.065	0.249	0.303	0.188	0.276	0.663	0.644	0.547	0.895

6.3.2 Assessing the inner (structural) model

The inner structural model of the study was assessed in a five-step process as shown in figure 6.7 below.

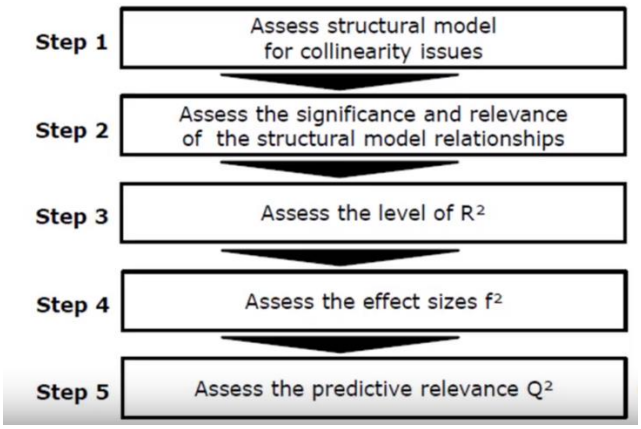


Figure 6.7: Assessment process of PLS-SEM structural model

Source: Hair *et al.* (2017)

Step 1: Assess structural model for collinearity issues

Multicollinearity occurs when two or more independent variables in a regression model are correlated and provide redundant information about the dependent variable. High collinearity between two or more formative indicators can seriously bias the results (Hair *et al.*, 2016). The collinearity statistics of all the independent variables used in the SEM model are shown in table 6.22 below:

Table 6.22: Collinearity statistics

	Innovation	Knowledge sharing
Organisational culture	1.246	1
Innovation	-	-
Knowledge sharing	1.246	-

According to Hair *et al.* (2017), the tolerance values (TOL) for collinearity should be greater than 0.2. With this in mind, the statistics above indicates that the multicollinearity of all variables used in the structural model was well within the acceptable range (organisational culture and innovation = 1.246, organisational culture and knowledge sharing = 1, knowledge sharing and innovation = 1.246). These results indicate that

there is a low correlation of one independent variable with a combination of the other independent variables in the model. Therefore, the assumption of the absence of multicollinearity was satisfied.

Step 2: Assess the significance and relevance of the structural model relationships

The direct effects of all the hypothesised relationships were evaluated using bootstrapping analysis. Bootstrapping is a resampling technique that draws a large number of subsamples from the original data (with replacement) and estimates models for each subsample. It is used to determine standard errors of coefficients to assess their statistical significance without relying on distributional assumptions (Hair *et al.*, 2017). The standardised beta and t-values were calculated by the bootstrapping procedure with a resample of 5 000. The results of the bootstrapping procedure are shown in table 6.23.

Table 6.23: Path model results of PLS-SEM

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision	95%CI LL	95%CI UL
H1	Organisation Culture -> Innovation	0.67	0.077	8.624	< 0.001	Supported	0.532	0.781
H2	Organisation Culture -> Knowledge Sharing	0.444	0.068	6.493	< 0.001	Supported	0.331	0.556
H3	Knowledge Sharing -> Innovation	0.058	0.063	0.961	0.336	Not supported	-0.044	0.162

Table 6.23 above shows a positive statistically significant relationship between organisational culture and innovation (β=0.67, p<0.001).
H1 is therefore supported.

Secondly, there is a positive statistically significant relationship between organisational culture and knowledge sharing (β=0.44, p<0.001).
H2 is therefore supported.

Lastly, path model results indicate that there is no statistically significant relationship between knowledge sharing and innovation (β=0.058, p=0.336).
H3 is therefore not supported.

Step 3: Asses the level of R^2

R-squared measures the proportion of variance in a latent endogenous variable that is explained by other exogenous variables expressed as a percentage (Chin, 1988). Exogenous constructs are independent variables in all equations in which they appear, whilst endogenous constructs are dependent variables in at least one equation, although they may be independent variables in other equations in the system. According to Evans (1996), R^2 is interpreted as follows: very weak (0–4%); moderate (16–36%); strong (36–64%); and very strong (64–100%). The R^2 values of the structural model are shown in table 6.24 below.

Table 6.24: R-square

	R-square
Innovation	0.482
Knowledge sharing	0.197

According to table 6.24, the R^2 value of innovation is 0.482. This means that organisational culture explains 48.2% of the variance in the innovation variable; hence organisational culture has a high predictive power towards the innovation variable. Furthermore, knowledge sharing had an R^2 value of 0.197, which means that organisational culture explains 19.7% of the variability of the knowledge sharing variable, which is a moderate predictive power.

Step 4: Assess the effect size (f^2)

The assessment of the effect size of a construct evaluates whether the omitted construct has a substantive impact on the endogenous construct, which is also known as the effect size of the exogenous latent variable on the model. The assessment of this effect size follows Cohen's (1988) guideline, namely:

$0.02 < \mathbf{f^2} < 0.15$: weak effect
$0.15 < \mathbf{f^2} < 0.35$: moderate effect
$f^2 > 0.35$: strong effect

The effect size of knowledge sharing on innovation and organisational culture on innovation was calculated and the results are displayed in table 6.25 below.

Table 6.25: Effect size (f^2)

Predictor	Endogenous construct	R^2 included	R^2 excluded	f^2 effect size
Knowledge sharing	Innovation	0.482	0.476	0.012
Organisational culture	Innovation	0.482	0.125	0.689

According to table 6.25, organisational culture has a large effect size (0.689), meaning that it plays a vital role in the prediction of innovation. However, the effect size of knowledge sharing on innovation was close to zero (0.012), meaning that it does not play a significant role in the prediction of innovation.

Step 5: Assess predictive relevance (Q^2)

Predictive relevance (Q^2) is a measure of a model's predictive power. It examines whether a model accurately predicts data not used in the estimation of model parameters. This characteristic makes Q^2 a measure of out-of-sample predictive power (i.e., predictive relevance) (Hair *et al.*, 2017). The predictive relevance (Q^2) of exogenous constructs uses the blindfolding procedure where every n^{th} data point in the endogenous construct's indicators is omitted to estimate the parameters with the remaining data points (Henseler, Ringle, & Sinkovis, 2009). Specifically, a Q^2 value larger than zero for a particular endogenous construct indicates the path model's predictive relevance for this particular construct (Hair *et al.*, 2016).

Table 6.26: Predictive relevance (Q^2)

Predictor	Endogenous construct	Q^2 included	Q^2 excluded	Q^2 Predictive relevance
Knowledge sharing	Innovation	0.225	0.222	0.004
Organisational culture	Innovation	0.225	0.059	0.214

From table 6.26 it can be noted that organisational culture portrayed a moderate level of relevance since the Q^2 value of 0.214 is greater than 0. However, knowledge sharing did not have predictive relevance at a value of 0.004.

In analysing the results of the PLS-SEM, it is important to bear in mind that factor loadings reflect the degree to which each item is linked to the factor (Valmohammadi &

Roshanzamir, 2015). Thus, a maximum factor loading means that the associated construct is best described by this factor. From the computations of the outer and inner model variables in the previous sections, this study developed the actual PLS-SEM as presented in figure 6.8 below.

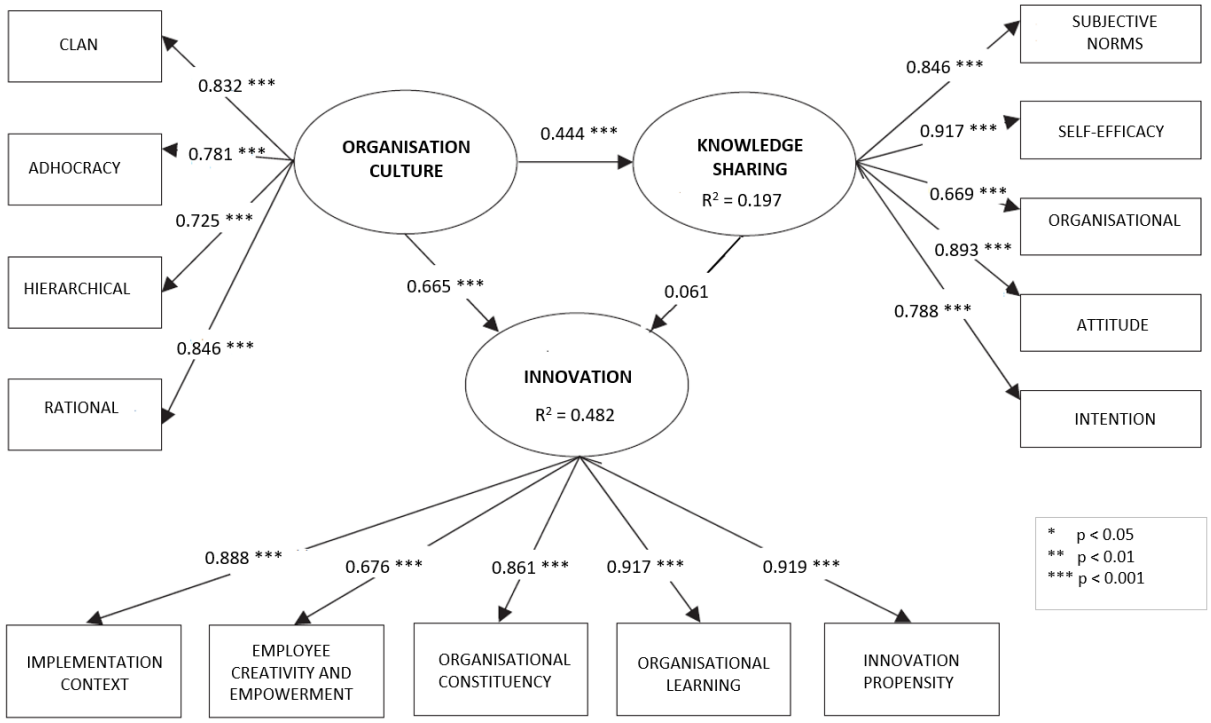


Figure 6.8: **The PLS-SEM for organisational culture, innovation and knowledge sharing at GZU**

By using the loadings of the structural equation model for the four culture quadrants, the culture map of the organisation was constructed as indicated in figure 6.9 below. Loadings reflect the degree to which each of the four culture types is linked to the organisational culture (Valmohammadi & Roshanzamir, 2015).

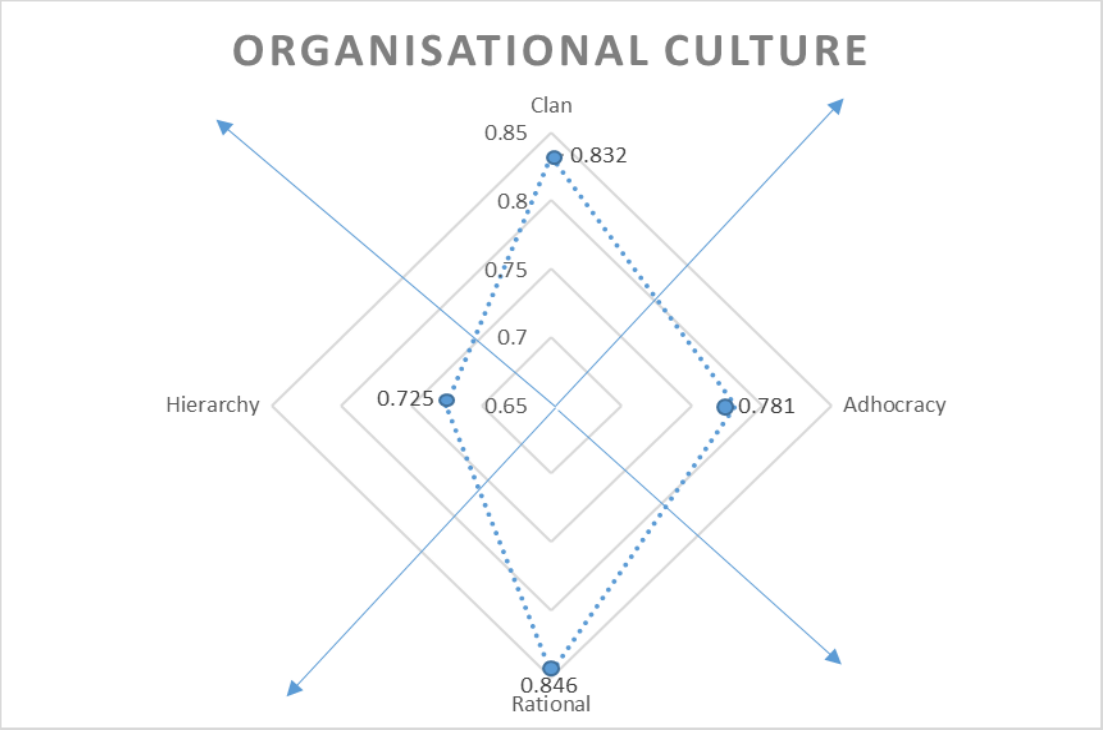


Figure 6.9: Organisational culture map of GZU

Discussion

In reflecting on the research findings, the following aspects emerged as prominent with regard to the variables.

Organisational culture: The strength of organisational culture is determined by the number of points awarded to a specific cultural type; hence the higher the score, the stronger or more dominant the particular culture (Valmohammadi & Roshanzamir, 2015). In line with this, the SEM results reflect that the prevailing organisational culture at GZU is best described as a rational culture (0.846) and clan culture (0.832) since they are the most dominant dimensions (see figure 6.9). This means that there are two major competing cultural types at GZU, the rational culture (with an emphasis on task accomplishment) and the clan culture (with an emphasis on family-like relationships).

The less prominent cultural types were the hierarchical and adhocracy cultures as reflected by factor loadings of 0.725 and 0.781 respectively (see figure 6.9). A weak adhocracy culture militates against organisational change, whereas an underdeveloped hierarchical culture might result in flaws in organisational control mechanisms.

Innovation: The SEM results indicated that innovation propensity is a significant driver of innovation at GZU with a maximum indicator loading of 0.919 (see figure 6.8). This implies that management must focus on strengthening attributes of innovation propensity such as the underlying culture, innovation goal setting and encouragement of knowledge sharing amongst GZU employees (see table 6.8). Organisational culture attributes such as tolerance for mistakes and risk taking are crucial in promoting an innovative culture. Furthermore, innovation goal setting is important, as it unifies the efforts of organisational members towards innovative activities.

Figure 6.8 reveals that another important driver of innovation is organisational learning with an indicator loading of 0.917. This means that attributes of organisational learning such as training, mentorship and innovation leadership (see table.6.7) should be prioritised. Training and mentorship facilitate the cross-pollination of knowledge amongst individuals. It is through training and mentorship that innovative ideas are exchanged and interrogated for the benefit of the organisation. Organisational leadership is mandated to develop the organisation's vision and mission in support of the innovation agenda, as well as provide resources for innovation, such as finance and equipment.

The implementation context and organisational constituency had factor loadings of 0.888 and 0.861 respectively (see figure 6.8). This finding underscores the importance of innovation resources and collaboration (see tables 6.9 and 6.6 respectively) in driving innovation activities. For an organisation to execute cutting-edge innovations, collaboration and resource adequacy are key factors. Innovation resources such as innovation hubs and TTOs facilitate new inventions and commercialisation of research respectively.

Finally, figure 6.8 reveals employee creativity and empowerment as the weakest link with innovation as shown by an indicator loading of 0.676. This represents a huge opportunity to tap into employees' creative ideas at the institution. Clearly, the human talent available is not being used to its full potential.

Knowledge sharing: From the SEM results, a significant driver of knowledge sharing at GZU seems to be self-efficacy, with a maximum indicator loading of 0.917 (see figure

6.8). This finding shows that GZU employees believe in the knowledge they possess and consider it important for the attainment of organisational objectives. A high degree of self-efficacy is significant because it creates confidence amongst knowledge sharers.

From figure 6.8 it is also evident that the attitude towards knowledge sharing is quite favourable at GZU, as indicated by a factor loading of 0.893. A high factor loading of the attitudes towards knowledge sharing indicates a positive evaluation of knowledge-sharing behaviours at GZU. This represents an opportunity for GZU to tap into the implicit knowledge resource amongst its human resources. Reference groups (as represented by subjective norms) also play a prominent role in influencing knowledge sharing at GZU, with a factor loading of 0.846 (see figure 6.8). GZU employees are therefore receptive to encouragement from peers and reference groups to share knowledge.

The intention to share knowledge had a factor loading of 0.788 (see figure 6.8) underlining the fact that GZU employees are ready to share their knowledge with colleagues at the institution. However, organisational support appears to be an impediment to the knowledge-sharing drive, with a factor loading of 0.669 (see figure 6.8). This indicates the likelihood of an underdeveloped knowledge-sharing infrastructure at the institution which can hinder the efforts to enhance knowledge sharing.

Test of research hypotheses

The overall picture as presented by the PLS-SEM (see figure 6.7) shows that organisational culture has a profoundly positive effect on innovation ($\beta=0.67$, $p<0.001$) and on knowledge sharing ($\beta=0.44$, $p<0.001$), and the effect of organisational culture on innovation ($\mathbf{R^2}=0.482$) is stronger than on knowledge sharing ($\mathbf{R^2}=0.197$). These results support the H1 and H2 of the PLS-SEM. However, a weak relationship exists between knowledge sharing and innovation ($\beta=0.058$, $p=0.336$), hence H3 was rejected.

6.4 Summary

Chapter 6 presented the research findings from an empirical point of view. The descriptive statistics for the various questions was analysed and discussed. The first part of the chapter provided background information of the respondents by analysing their demographic profile, including gender, age, qualifications, work section and the number of years in the current position. The second part of the chapter presented a descriptive summary of questions 6 (organisational culture), 7 (innovation) and 8 (knowledge sharing) of the survey, followed by a discussion on the construction of the research model. The relationships found between organisational culture, innovation and knowledge sharing were discussed.

The following chapter provides the conclusions drawn from the findings, followed by the contribution of the research to the field of study. Limitations of the research will be mentioned, and recommendations will be made which can be submitted to the management of GZU.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The previous chapter presented an analysis of the data collected for this study. The quantitative analysis assisted in describing the data. The aim of this chapter is to delineate the conclusions according to the research objectives provided in chapter 1. The chapter will also indicate the contribution of the study, the limitations and recommendations, as well as areas for further research.

7.2 Conclusions

This study focused on the impact of organisational culture on innovation and knowledge sharing in a university context, with a specific focus on GZU. As indicated before, a structured questionnaire was administered to the academic and non-academic staff members of GZU. The questionnaire consisted of three sections. Section A focused on demographic information, whilst sections B, C and D measured organisational culture, innovation and knowledge sharing respectively.

7.2.1 The dominant culture of GZU

As indicated before, the CVF was used in exploring the deep structures of organisational culture relating to compliance, motives, leadership, decision making and effectiveness (Zu *et al*., 2010) amongst different stakeholders. The CVF assumes that an organisation has no single goal, but that a number of competing values are held by the various stakeholders which could lead to diverse goals and objectives. According to Cameron and Quinn (2006), organisations can reflect a dominant cultural orientation. In more than 80% of organisations these authors had studied, one or more dominant cultural type could be distinguished, as was the case with GZU.

The results of the current study revealed that the dominant culture at GZU was the rational culture, followed closely by the clan culture. Hence, the conclusion is drawn that GZU has two major competing cultural dimensions represented by the rational/clan culture. The rational culture type focuses on the external environment of the business

and the need for achievement amongst organisational members (Hartnell *et al.*, 2011). In the context of a university, staff members are expected to perform a variety of activities such as research output, community engagement projects and teaching and learning. This means organisational members are expected to be task and goal oriented (Zu *et al*., 2010). It can therefore be reasoned that the majority of GZU members are competitive, task oriented and focused on achieving personal goals.

This finding corresponds with that of Omerzel, Biloslavo, and Trnavcevic (2019), who determined that the rational culture was the most dominant culture in one of the public universities in Slovenia. Furthermore, in a study on private universities in Malaysia, Ramachandran, Chong, and Hishamuddin (2011) found the rational culture to be the most dominant culture. In contrast, Dogan (2010) and Allameh, Zamani, Mohammad, and Davoodi (2011) identified the hierarchical culture as the most dominant cultural dimension at Ege University in Turkey and Isfahan University in Iran respectively.

The clan culture is internally oriented and focused on maintaining family-like relationships within the group (Cho *et al*., 2013). This cultural type is characterised by a sense of belonging, trust and involvement amongst team members. It should further be born in mind that many African societies are collectivistic in nature, meaning there is an emphasis on a tight social framework where individuals look after one another and share in decision making (Hofstede, 2011). This is in contrast to individualistic societies, where people prefer to act as individuals, rather than members of a group.

The hierarchical and adhocracy cultures were found to be the less prominent dimensions at GZU. The hierarchical cultural type is internally oriented and is supported by an organisational structure driven by control mechanisms (Hartnell *et al.*, 2011). The emphasis of this type of culture is on documenting, measuring and managing information (Lindquist & Marcy, 2016). The weak hierarchical culture at GZU can affect the effectiveness of the whole system. Control mechanisms are required to manage goal accomplishment in such areas as cost management, teaching and research output. Therefore, weak control-monitoring mechanisms are likely to have a negative impact on the operational efficacy of GZU.

The adhocracy culture is externally oriented and emphasises growth, resource acquisition, creativity, flexibility and change (Cho *et al*., 2013). The weak adhocracy culture at GZU can affect strategies such as innovation, the ability to anticipate clients' needs, and the ability to implement creative solutions to university problems.

7.2.2 Levels of innovation at GZU

Weak innovation triggers identified from the results, such as the absence of an innovative culture, innovation mentorship and innovation training, point to low innovation levels at GZU. The attributes of organisational learning such as innovation mentorship and innovation training are not fully developed (see table 6.7). Furthermore, 33.3% of the respondents stated that the underlying culture of GZU does not support innovation (see table 6.8), whilst 53.3% of the respondents observed that GZU had a poor record of rolling out innovation (see table 6.9). This implies the existence of a weak innovation environment.

These findings differ from those of Sutanto (2017) who studied universities in East Java, Indonesia, and established that organisational learning and creativity had a significant impact on innovation. These variables were found to be weak at GZU. Also, organisational culture, especially the adhocracy culture, has been identified as conducive to innovation (see Büschgens *et al*., 2013; Naranjo *et al.*, 2015; Naranjo *et al*., 2017). Because it has a weak adhocracy culture (see figure 6.8), GZU's ability to undertake innovation is likely to be affected. Based on the arguments above, this study concludes that the innovation level at GZU is likely to be moderately low.

7.2.3 Level of knowledge sharing at GZU

The triggers for knowledge sharing are very strong at GZU, as indicated by employees' high levels of self-efficacy (see table 6.11), positive attitudes towards knowledge sharing (see table 6.13), and good intentions to share knowledge (see table 6.14). This augurs well for an environment that is fertile for knowledge-sharing practices.

Although the employees' intention to share knowledge and their attitude towards knowledge sharing are positive, this study argues that actual knowledge sharing might

be hindered by the low level of organisational support and trust identified by the findings. A total of 38.5% of the respondents stated that GZU does not support the formation of knowledge-sharing networks (such as communities of practice) (see table 6.12). Furthermore, 37.9% observed that GZU lacked processes (such as meetings) to share knowledge (see table 6.12). Not only that, 36.9% highlighted the lack of trust and mutual respect at GZU (see table 6.6). According to Jolaee *et al*. (2014), organisational support and trust are key enablers of knowledge sharing. Hence, the absence or lack of these two factors impedes knowledge sharing. For this reason, the study concludes that the level of knowledge sharing at GZU might be low.

7.2.4 Organisational culture and innovation

This study concludes that organisational culture has a positive impact on innovation. This was confirmed by the PLS-SEM computations which revealed that organisational culture had a profound effect on innovation ($\beta=0.67$, $p<0.001$). This SEM result means that a one-unit change in organisational culture has a positive impact of 67% on the innovation variable. The implication to university managers is that they have to create a conducive organisational culture in order to advance the innovation agenda at the university. A conducive organisational culture environment can be characterised by aspects such as taking risk, tolerating mistakes, encouraging creativity and sharing knowledge extensively.

These results correspond with the findings of Zhu (2015) who concluded that dimensions of organisational culture are significantly associated with the technology-enhanced innovation amongst Chinese universities. Numerous other studies also confirm that organisational culture has a positive effect on innovation (see Brettel, Chomik, & Flatten, 2011; Efrat, 2014; Hazana *et al.*, 2014; Naranjo *et al*., 2015; Naranjo *et al*., 2017).

7.2.5 Organisational culture and knowledge sharing

This study concludes that organisational culture has a positive influence on knowledge sharing. This was confirmed by the PLS–SEM computations which revealed that organisational culture has a significant effect on knowledge sharing ($\beta=0.44$, $p<0.001$).

This SEM result means that a one-unit change in organisational culture can have a positive impact of 44% on the knowledge sharing variable. The implication to university managers is that they have to build knowledge-sharing blocks such as reward mechanisms for knowledge sharers and create knowledge-sharing infrastructure and a supportive organisational culture. The clan culture, which was identified as the second most dominant cultural orientation at GZU, can have a significantly positive influence on knowledge sharing (Suppiah & Sandhu, 2011).

This finding is corroborated by that of Howell and Annansingh (2013), namely that organisational culture had a significant impact on knowledge sharing in United Kingdom universities. Previous research also supports the positive relationship between organisational culture and knowledge sharing (see Al-Alawi *et al*., 2007; Rahman & Moonesar, 2018; Suppiah & Sandhu, 2011).

7.2.6 Knowledge sharing and innovation

This study concludes that there is a weak relationship between knowledge sharing and innovation. This is confirmed by the PLS-SEM computations which established that the relationship is not statistically significant (β=0.058, p=0.336). This means that a one-unit change in knowledge sharing can result in a 5.8% change in innovation. This is a weak relationship; hence managers have to devise strategies that enhance knowledge sharing, of which organisational culture is one.

This finding differs from that of Al-Husseini and Elbeltagi (2016), namely that knowledge-sharing processes were positively related to product and process innovation in Iraqi higher education institutions. The finding also differs from that of Alnesr and Ramzani (2019), namely that there was a positive relationship between knowledge sharing and innovation in Syrian public and private universities. Kamaşak and Bulutlar (2010) also reported that knowledge sharing was positively related to innovation.

This study argues that the weak knowledge sharing–innovation relationship at GZU can be explained by the organisational cultural matrix of the university. The dominant culture at GZU is the rational culture, whilst one of the weak cultures is the adhocracy culture. The relation of these two cultures to knowledge sharing and innovation is

comprehensively discussed below. Rational cultures are generally associated with competitive employee behaviour; hence employees are more likely to pursue personal goals at the expense of the organisation's objectives. In a dominant rational culture, knowledge is seen as a critical source of power and distinctiveness. For this reason, employees may be inhibited to voluntarily share their knowledge to help colleagues (Cavaliere & Lombardi, 2015). When knowledge is not shared, social interaction is limited, organisational creativity is diminished, and innovation is suppressed ultimately.

On the other hand, adhocracy cultures are associated with high levels of entrepreneurship and risk taking. Consequently, the adhocracy culture is most likely to support social interaction and stimulate employees to exchange ideas and opinions (Cavaliere & Lombardi, 2015). Unfortunately, the adhocracy culture is weak at GZU; hence knowledge sharing is limited at GZU, which, in turn, affects innovative behaviours.

7.3 Contribution

Organisational culture plays an important role in enhancing innovation and knowledge sharing. A conducive organisational culture is characterised by risk taking, supportive and capable leadership, abundant resources and trust, all of which can enhance the level of innovation and knowledge sharing. This study found enough evidence to validate the fact that there is a positive relationship between organisational culture and innovation and between organisational culture and knowledge sharing.

The study is the first to present a conceptual model of organisational culture, innovation and knowledge sharing in the context of Zimbabwean universities, and also the first to examine these variables empirically. As Zimbabwean universities are now required to lead the industrialisation and modernisation agenda, it is important to understand the prevailing organisational culture within universities. Such knowledge would help universities to create cultures that facilitate innovation and knowledge sharing – two variables that are critical in driving industrialisation and modernisation. This study offers a frame of reference for university leadership to appreciate the importance of organisational culture in driving the innovation agenda.

In addition, this study is the first to present a framework for enhancing innovation and knowledge sharing in the context of Zimbabwean universities (see figure 7.1). This framework can be used by university managers who seek to be relevant in the 21st century. The current wave of globalisation is presenting challenges such as competition, ever-changing technologies, reduced funding from central government and high student mobility. The proposed framework can be used by universities that are seeking to survive in such a challenging environment. With this framework, innovative cultures and innovation infrastructure can be created to attract talented students who can produce cutting-edge research output.

7.4 Limitations

The research was conducted at one university and therefore the findings cannot be generalised to other universities. Given the infancy of studies pertaining to the impact of organisational culture on innovation and knowledge sharing in Zimbabwean universities, further empirical research in the field is expected to produce more generalisable findings.

The online SurveyMonkey tool was employed to collect data concerning three concepts. The challenge pertained to the fact that respondents were not given the opportunity to express their feelings and opinions. Thus, other data collection instruments such as interviews and/or open-ended questions could be used for comprehensive data collection in future studies.

Lastly, the impact of organisational culture was tested on two variables only. Ideally, other endogenous variables could be included in future research such as total quality management and competitive advantage – which are also important for universities seeking to improve their performance.

7.5 Recommendations

Based on the findings of the investigation and literature review, this study proposes a framework that can be adopted by GZU management to enhance innovation and knowledge sharing as presented in figure 7.1 below:

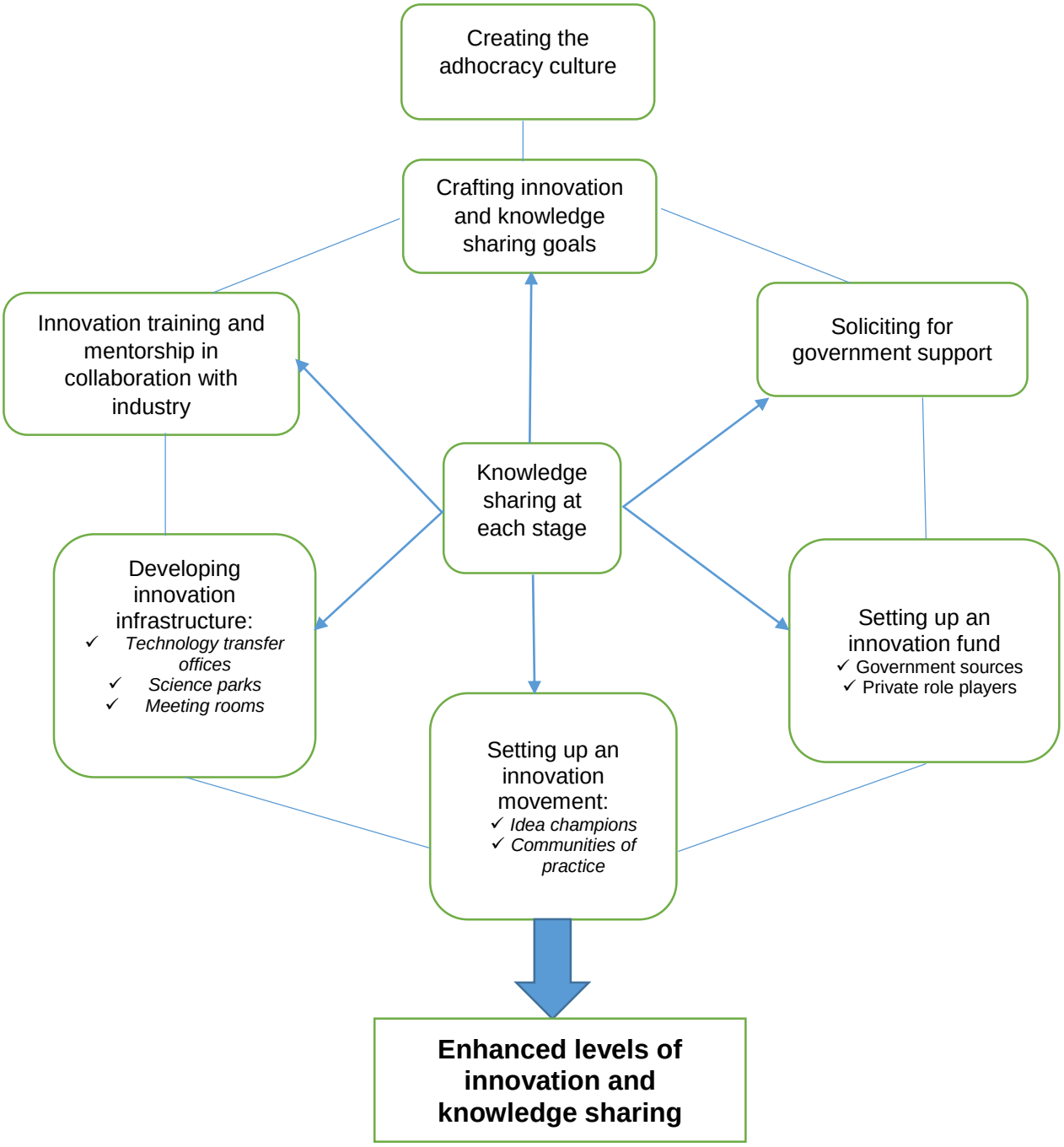


Figure 7.1: A framework for enhancing innovation and knowledge sharing at GZU
Source: The researcher's own work

The components of the framework are explained below.

Creating the adhocracy culture: As indicated before, the adhocracy culture enhances innovation and knowledge sharing (see Cavaliere & Lombardi, 2015; Naranjo *et al*., 2017). However, this cultural type is underdeveloped at GZU (see figure 6.8). Adhocracy culture is associated with risk taking, high levels of entrepreneurship and creativity, which are all critical in facilitating a highly innovative environment. It is therefore recommended that GZU management create this culture as it is conducive to innovation and knowledge sharing. Students, lecturers and non-academic staff should be allowed to experiment with ideas to facilitate the process of innovation.

Creating innovation and knowledge sharing goals: There is a lack of coherent innovation goals at GZU (see table 6.8). Hence it is proposed that strategic innovation and knowledge-sharing goals be developed so that all organisational efforts are aligned towards achieving them. Innovation and knowledge-sharing goals should be part of the mission of the university (see section 3.6 and 3.8.3.2 respectively) and be well articulated to university stakeholders to ensure maximum effect.

Innovation training and mentorship: Innovation training is underdeveloped at GZU (see table 6.7); hence innovation training should be part of GZU's strategy. Innovation training should help staff and students undertake applied research, which can lead to innovative thinking. Furthermore, mentorship would enable the transfer of knowledge, especially from role models from the industry who have launched successful companies and products. These role models can engage individual students in start-up ideas and business plans. The forging of partnerships between academics and entrepreneurs in the industry should be a priority for GZU management.

Government support: Government is crucial in advancing the innovation agenda of universities (see section 3.6); hence universities have to solicit for government support. Government should provide policies that support innovation in universities, for example, granting customs duty rebate on imported innovation equipment, rewarding researchers for innovative ideas and providing land for the development of innovation infrastructure such as science parks. Not only that, but government can also provide funding for cutting-edge research and platforms for knowledge sharing like research symposiums.

Developing innovation infrastructure: Innovation infrastructure is necessary to facilitate the whole process of starting innovative research and commercialising it (see section 3.6). GZU management can set up meeting rooms, incubation hubs, science parks and TTOs that facilitate the creation of innovation at the university and the transfer of the same to the industry. Moreover, the creation of innovation infrastructure would enhance knowledge sharing at the university.

Setting up an innovation fund: Funding is a crucial element in helping researchers' ideas become a reality. Funding is required not only to purchase equipment for innovation, but also to reward innovation champions on the campuses. These funds can come from government or private stakeholders.

Creating an innovation movement: This movement would comprise a group of people who can spearhead innovations at the university. It can take the form of communities of practice (research teams). The university has to take the lead in creating such teams. This movement can also perform the role of celebrating innovators – which is an important activity.

The elements proposed in figure 7.1 above can result in enhanced innovation and knowledge sharing at GZU.

7.6 Further research

Further research could be useful in two instances particularly. Firstly, further research can focus on replicating this study in other universities in Zimbabwe so as to confirm the findings of this study. These studies should include qualitative data collection methods, like interviews, to capture the comprehensive opinions of respondents. Secondly, the selected dependent variables (innovation and knowledge sharing) are not the only factors that enhance the success of universities in the highly competitive globalised environment. There are other important drivers of success such as total quality management and employee attitudes that need to be tested against organisational culture in a university environment.

7.7 Summary

Many studies have focused on the relationship between organisational culture, innovation and knowledge sharing. However, the current study is the first empirical investigation known to the researcher which investigated the impact of organisational culture on innovation and knowledge sharing at a university in Zimbabwe.

As the Zimbabwean university landscape is undergoing major transformation in order to be relevant in the 21st century, the researcher believes that this study will stimulate valuable dialogue that will, in turn, result in universities' fostering cultures that support innovation and knowledge sharing. Although organisational culture, innovation and knowledge sharing have been widely researched, literature on the impact of organisational culture on innovation and knowledge sharing in the university context is scant. This study established that a conducive organisational culture drives innovation and knowledge sharing. Hence, by creating such a culture, an organisation will gain a competitive edge in the marketplace.

LIST OF REFERENCES

Abdi, K., Mardani, A., Senin, A. A., Tupeniate, L., Naimaviciene, J., Kanapeckiene, L., & Kutut, V. (2018). The effect of knowledge management, organisational culture and organisational learning on innovation in automobile industry. *Journal of Business Economics and Management,* 19(1), 1–19.

Afsar, B., Badir, Y., & Kiani, U. S. (2016). Linking spiritual leadership and employee pro-environmental behavior: The influence of workplace spirituality, intrinsic motivation, and environmental passion. *Journal of Environmental Psychology*, *45*(1), 79–88.

Afsar, B., & Rehman, M. (2015). The relationship between workplace spirituality and innovative work behavior: The mediating role of perceived person–organization fit. *Journal of Management, Spirituality & Religion*, *12*(4), 329–353.

Ajzen, I., (1985). From intention to actions: A theory of planned behaviour. In J. Kuhl, & J. Beckman (Eds.), Action control: From cognition to behaviour (pp. 11-39). New York: Springer-Verlag.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.

Al-Alawi, A., Al-Marzooqi, N., & Mohammed, F. Y. (2007). Organizational culture and knowledge sharing: Critical success factors. *Journal of Knowledge Management*, *11*(2), 22–42.

Al-Busaidi, K. A., & Olfman, L. (2017). Knowledge sharing through inter-organizational knowledge sharing systems. *VINE Journal of Information and Knowledge Management Systems*, *47*(1), 110–136.

Al-Husseini, S., & Elbeltagi, I. (2016). The role of knowledge sharing in enhancing innovation: A comparative study of public and private higher education institutions in Iraq, viewed 02 July 2019 from

http//www.tandofonline.com/iol/rile/20

Allameh, M., Zamani, M., Mohammad, S., & Davoodi, R. (2011). The relationship between organizational culture and knowledge management (A case study: Isfahan University). *Procedia Computer Science*, *3*, 1224–1236, viewed 05 July 2019 from www.sciencedirect.com.

Alnesr, B., & Ramzani, S. R. (2019). The mediating role of knowledge sharing between organizational culture and innovation in syrian public and private universities. *International Advanced Research Journal in Science, Engineering and Technology, 6*(1), 22–29.

Aman, O., Rahman, N. A., & Feisal, A. (2015). The determinants of organisational culture that influences creativity and innovation. 2nd International Conference on Management, Lankawi Kedah, Malaysia, 11 – 12 June 2012.

Arts, K. W., Norman, P. M., & Hatfield, D. E. (2010). Firm performance: A longitudinal study of R&D, patents, and product innovation. *Academy of Management Proceedings*, *2003*(1), B1–B6.

Aspromourgos, T. (2012). The managerialist university: An economic interpretation, *Australian Universities Review*, *54*(2), 44–49.

Aziz, N. N. A., & Samad, S. (2016). Innovation and competitive advantage: Moderating effects of firm age in foods manufacturing SMEs in Malaysia. *Procedia Economics and Finance*, *35*(10), 256–266.

Bagozzi, R. P. (1986). Evaluating structural equation models with unobservable variables and measurement error: A comment. *Journal of Marketing Research,* 18(1), 375–381.

Bahari, S. F. (2010). Qualitative versus quantitative research strategies: Contrasting epistemological and ontological assumptions. *Jurnal Teknologi*, *52*(1), 17–28.

Bailey, G., & Peoples, J. (2002). *Essentials of cultural anthropology*. Belmont: Wadsworth/Thompson Learning.

Bailey, G., & Peoples, J. (2012). *Humanity: An introduction to cultural anthropology*. Belmont: Wadsworth/Cengage Learning.

Bandura, A. (1994). Self-efficacy. *Encyclopedia of Human Behavior*, *4*(1994), 71–81.

Baron, R. A., Byrne, D. E., & Suls, J. M. (1989). *Exploring social psychology*. Boston, Mass: Allyn and Bacon.

Bell, M., & Figueiredo, P. N. (2012). Innovation capability building and learning mechanisms in latecomer firms: Recent empirical contributions and implications for research. *Revue Canadienne d'Études du Dévelopment, 33*(1), 14–40.

Beugelsdijk, S., Kostova, T., & Roth, K. (2017). An overview of Hofstede-inspired country-level culture research in international business since 2006. *Journal of International Business Studies*, *48*(1), 30–47.

Bloom, N., Draca, M., & Van Reenen, J. (2016). Trade induced technical change? The impact of Chinese imports on innovation, IT, and productivity. *Review of Economic Studies, 83*(1), 87–117.

Bloom, N., & Van Reenen, J. (2007). Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics, 122*(4), 1351–1408.

Bloom, N., & Van Reenen, J. (2010). Why do management practices differ across firms and countries? *Journal of Economic Perspectives, 24*(1), 203–204.

Bock, G. W, Zmud, R. W, Kim. Y. G, & Lee, J, N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly*, *29*(1), 87.

Boardmand, P. C., & Ponomariov, B. L. (2009). University researchers working with private companies. *Technovation*, *29*(4), 142–153.

Bogdanowicz, M. (2014). Organizational culture as a source of competitive advantage – Case study of a telecommunication company in Poland. *Contemporary Management Quarterly*, *13*(3), 53–66.

Bohon, L. M., Cotter, K. A., Kravitz, R. L., Cello, P. C., & Fernandez y Garcia, E. (2016). The theory of planned behavior as it predicts potential intention to seek mental health services for depression among college students. *Journal of American College Health*, *64*(8), 593–603.

Brettel, M., Chomik, C., & Flatten, T.C. (2011). How organisational culture influences innovativess, proactiveness and risk taking: Fostering entrepreneurial orientation in SMEs. *Journal of Business Management, 47*(4), 443–464.

Breznik, L., & Hisrich, R. D. (2014). Dynamic capabilities vs. innovation capability: Are they related? *Journal of Small Business and Enterprise Development*, *21*(3), 368–384.

Breznitz, S. M., & Feldman, M. P. (2012). The engaged university. *Journal of Technology Transfer*, *37*(2), 139–157.

Bryman, A., & Bell, E. (2011). *Business research methods*. Oxford: Oxford University Press.

Buchanan, J., Kelley, B., & Hatch, A. 2016. Digital workplace and culture: How digital technologies are changing the workforce and how enterprises can adapt and evolve, viewed 25 January 2018 from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/human-capital/us-cons-digital-workplace-and-culture.pdf

Burnes, B., Wend, P., & By, R. T. (2013). The changing face of English universities: Reinventing collegiality for the twenty-first century. *Studies in Higher Education*, (June 2014), 37–41.

Büschgens, T., Bausch, A., & Balkin, D. B. (2013). Organizational culture and innovation: A meta-analytic review. *Journal of Product Innovation Management*, *30*(4), 763–781.

Cabrera, A., Collins, W. C. & Salgado, J. F. (2006). Determinants of individual engagement in knowledge sharing. *International Journal of Human Resource Management, 17*(2), 245-264.

Cacciattolo, K. (2014). Understanding organisational cultures. *European Scientific Journal*, *2*(November 2014), 1857–7881.

Cai, Y., & Liu, C. (2015). The roles of universities in fostering knowledge-intensive clusters in Chinese regional innovation systems. *Science and Public Policy*, *42*(1), 15–29.

Cameron, K. S. (2009). *An introduction to the competing values framework*. San Francisco, CA: Jossey-Bass.

Cameron, K. S., & Quinn, R. E. (2006). Diagnosing and changing organizational culture. *The Jossey-Bass Business & Management Series*. San Francisco, CA: Jossey-Bass.

Cameron, K. S., & Quinn, R. E. (2011). *Diagnosing and changing organizational culture: Based on the competing values framework*. San Francisco, CA: Jossey-Bass.

Camisón, C., & Villar-López, A. (2014). Organizational innovation as an enabler of technological innovation capabilities and firm performance. *Journal of Business Research*, *67*(1), 2891–2902.

Carraher, S., Parnell, J. A., & Spillan, J. E. (2009). Customer service orientation of small retail business owners in Austria, the Czech Republic, Hungary, Latvia, Slovakia, and Slovenia. *Baltic Journal of Management, 4*(3) 251–268.

Castro, M. L., & Martins, N. (2010). The relationship between organisational climate and employee satisfaction in a South African information and technology organisation. *SA Journal of Industrial Psychology*, *36*(1), viewed 17 October 2017 from www.sajip.co.za.

Cavaliere, V., & Lombardi, S. (2015). Exploring different cultural configurations: How do they affect subsidiaries' knowledge sharing behaviors? *Journal of Knowledge Management*, *19*(2), 141–163.

Chatzoglou, P. D., & Vraimaki, E. (2009). Knowledge-sharing behaviour of bank employees in Greece. *Business Process Management Journal*, *15*(2), 245–266.

Chen, S. S., Chuang, Y. W., & Chen, P. Y. (2012). Behavioral intention formation in knowledge sharing: Examining the roles of KMS quality, KMS self-efficacy, and organizational climate. *Knowledge-Based Systems*, *31*, 106–118.

Chen, Y. H., Lin, T. P., & Yen, D. C. (2014). How to facilitate inter-organizational knowledge sharing: The impact of trust. *Information and Management*, *51*(5), 568–578.

Chilisa, B., & Kawulich, B. (2012). Selecting a research approach: paradigm, methodology, and methods. *Doing Social Research A Global Context*, viewed on 05 August 2017 from www.researchgate.net.

Chin, W. W. (1988). The partial least squares approach to structural equation modelling. *Modern Methods for Business Research*, *295*(2), 295-336.

Cho, I., Kim, J. K., Park, H., & Cho, N.-H. (2013). The relationship between organisational culture and service quality through organisational learning framework. *Total Quality Management & Business Excellence*, *24*(7–8), 753–768.

Chong, S., Geare, A., & Willett, R. J. (2017). Change in a New Zealand university 1985–2010. *Educational Management Administration & Leadership*, *46*(6), 1–6.

Cirera, X., & Maloney, W. F. (2017). The innovation paradox: Developing-country capabilities and the unrealized promise of technological catch-up, viewed 05 January 2018, from https://openknowledge.worldbank.org/bitstream/handle/10986/28341/9781464811609.pdf

Clercq, D., De Menguc, B., & Auh, S. (2009). Unpacking the relationship between an innovation strategy and firm performance: The role of task conflict and political activity. *Journal of Business Research*, *62*(11), 1046–1053.

Coccia, M. (2017). Sources of technological innovation: Radical and incremental innovation problem-driven to support competitive advantage of firms. *Technology Analysis and Strategic Management*, *29*(9), 1048–1061.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. New York, NY: Routledge Academic.

Colombo, M., Laursen, K., Magnusson, M., & Lamastra, R. C. (2011). Organizing inter- and intra-firm networks: What is the impact on innovation performance. *Industry and Innovation, 18*(6), 531–538.

Comesa. (n.d.). ANNEX IV Reports on the COMESA Science, Technology and Innovation Programme, 1–13, viewed 28 November 2018 from https://www.comesa.int

Creswell, J. W. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.

Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, *47*(6), 1154–1191.

Cummings, T. G., & Worley, C. G. (2009). *Organisation development and change*.

USA: Cengage Learning.

D'Este, P., & Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial university and individual motivations. *Journal of Technology Transfer*, *36*(3), 316–339.

Damanpour, F., & Aravind, D. (2012). Managerial innovation: Conceptions, processes, and antecedents. *Management and Organization Review*, *8*(2), 423–454.

Daniel, J. L. (2015). Workplace spirituality and stress: Evidence from Mexico and US. *Management Research Review*, *38*(1), 29–43.

Deal, T. E. & Kennedy, A. A. (2000). *The new corporate cultures: Revitalizing the workplace after downsizing, mergers and reengineering*. London: Texere Publishing Limited.

Deem, R. (2011). New managerialism and higher education: The management of performances and cultures in universities in the United Kingdom. *International Studies in Sociology of Education, 5*(3), 37–41.

Deiaco, E., Hughes, A., & McKelvey, M. (2012). Universities as strategic actors in the knowledge economy. *Cambridge Journal of Economics*, *36*(3), 525–541.

Deloitte. (2017). Deloitte 2017 Global human capital trends: Rewriting the rules for the digital age. Report 144, viewed 03 January 2018 from https://www2.deloitte.com

Denison, D. R. (1990). *Corporate culture and organisational effectiveness.* New York: John Wiley and Sons.

Denison, D. R., & Spreitzer, G. M. (1991). Organizational culture and organizational development: A competing values approach. *Research in Organizational Change and Development*, *5*(1), 1–21.

Deshpande, R., & Webster, F. (1989). Organizational culture and marketing: Defining

the research agenda. *Journal of Marketing*, *53*(2), 3–15.

Dobni, C. B. (2008). Measuring innovation culture in organizations. *European Journal of Innovation Management*, *11*(4), 539–559.

Dogan, M. (2010). The organizational culture at the university. *The International Journal of Educational Researchers, 2*(1), 1–13.

Dutta, S., Lanvin, B., & Wunsch-Vincent, S. (2018). The Global Innovation Index Report 2018, viewed 17 May 2019 from https://www.wipo.int/global innovation index 2018

Ederer, F., & Manso, G. (2013). Is pay-for-performance detrimental to innovation?, *Management Science*, *59*(7), 1496–1513.

Efrat, K. (2014). The direct and indirect impact of culture on innovation. *Technovation*, *34*(1), 12–20.

Engel, J. (2014). Global clusters of innovation: lessons from the Silicon Valley. *California Management Review, 57*(2), 36–65.

Etzkowitz, H. (2008). *The triple helix: University–industry–government innovation in action*. New York and London: Routledge, Taylor and Francis Group.

Evans, J. (1996). Straightforward statistics for the behavioral sciences. Pacific Grove: CA: Brooks/Cole Publishing.

Fernández Sastre, J., & Vera, C. E. V. (2017). Cooperation for innovation in developing countries and its effects: Evidence from Ecuador. *Journal of Technology Management and Innovation*, *12*(3), 48–57.

Fishbein, M., & Ajzen, I. (1975). *Beliefs, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley Publishing Company.

Froehlich, C., Cristina, C., & Bonzanini, M. (2017). The use of dynamic capabilities to boost innovation in a Brazilian Chemical Company. *Revista de Administração*, viewed 01 November 2018 from www.sciencedirect.com

Fullwood, R., Rowley, J., & Delbridge, R. (2013). Knowledge sharing amongst academics in UK universities. *Journal of Knowledge Management*, *17*(1), 123–136.

Garicano, L., & Rossi-Hansberg, E. (2015). Knowledge-based hierarchies: Using organizations to understand the economy. NBER Working Paper No. 20607, Cambridge, MA: National Bureau of Economic Research.

Garwe, E. C. (2014). Quality assurance challenges and opportunities faced by private Universities in Zimbabwe. *Journal of Case Studies in Education, 1*(1), 1–16.

Gatling, A., Kim, J. (Sunny), & Milliman, J. (2016). The relationship between workplace spirituality and hospitality supervisors' work attitudes. *International Journal of Contemporary Hospitality Management*, *28*(3), 471–489.

Gault, F. (2018). Defining and measuring innovation in all sectors of the economy. *Research Policy, 47*(1), 617–622.

Gefen, D., Straub, D. W., & Boudreau, M. C. (2000). Structural equation modelling and regression: Guideline for research practice. *Communications of Association for Information Systems*, *4*(1), 1–79.

George, G., Mcgahan, A. M., & Prabhu, J. (2012). Innovation for inclusive growth: Towards a theoretical framework and a research agenda. *Journal of Management Studies*, *49*(4), 661–683.

Gibbs, M., Neckermann, S., & Siemroth, C. (2015). A field experiment in motivating employee ideas. Tinbergen Institute Discussion Papers 14–045/VII, Tinbergen Institute.

Glisson, C. (2015). The role of organizational culture and climate in innovation and effectiveness. *Human Service Organizations: Management, Leadership & Governance*, *39*(4), 245–250.

Grabowski, L., Neher, C., Crim, T., & Mathiassen, L. (2015). Competing values framework application to organizational effectiveness in voluntary organizations: A case study. *Nonprofit and Voluntary Sector Quarterly*, *44*(5), 908–923.

GZU, (2015). GZU Annual Report 2015, viewed 10 January 2019 from http://www.gzu.ac.zw/wp-content/uploads/2017/02/2015 Annual Report.pdf

GZU, (2018). GZU HR Office Report, Masvingo.

Grix, J. (2002). Introducing students to the generic terminology of social research. *Politics*, *22*(3), 175–186.

Guerrero, M., Urbano, D., Cunningham, J., & Organ, D. (2014). Entrepreneurial universities in two European regions: A case study comparison. *Journal of Technology Transfer*, *39*(3), 415–434.

Gunday, G., Ulusoy, G., Kilic, K., & Alpkan, L. (2011). Effects of innovation types on firm performance. *International Journal of Production Economics*, 133(3), 662–676.

Hair, J. F., Sarstedt, M., Hopkins, L., & Kupperlwieser, V. G. (2016). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review, 26*(2), 106–121.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modelling (PLS-SEM).* Thousand Oaks: Sage Publications.

Handy, C. (1985). *Understanding organizations*. London: Penguin Books.

Hartmann, A. (2006). The role of organizational culture in motivating innovative behaviour in construction firms. *Construction Innovation*, *6*(3), 159–172.

Hartnell, C. A., Ou, A. Y., & Kinicki, A. (2011). Organizational culture and organizational effectiveness: A meta-analytic investigation of the competing values framework's theoretical suppositions. *Journal of Applied Psychology*, *96*(4), 677–694.

Hazana, N., Shamsuddin, A., Wahab, E., Aziati, N., & Hamid, A. (2014). The relationship between organizational culture and product innovativeness. *Procedia – Social and Behavioral Sciences*, *129*, 140–147.

Henrike, H. (2014). The impact of health care professionals' service orientation on patients' innovative behavior. *Health Care Management Review, 39*(4), 329–339.

Henseler, J., Ringle, C. M, & Sinkovis, R. R. (2009). The use of partial least squares modelling in international marketing. *Advances in International Marketing*, *20*(1), 277–320.

Hess, B., Markson, E. W., & Stein, P.J. (1996). *Sociology*. Harlow, UK: Pearson.

Hofstede, G. (1980). Culture's Consequences: International Differences in Work-Related Values. Beverly Hills, CA: Sage.

Hofstede, G. (2001), Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations, Sage Publications, Thousand Oaks, CA.

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, *2*(1), 1–26.

Hogan, S. J., & Coote, L. V. (2014). Organizational culture, innovation, and performance: A test of Schein's model. *Journal of Business Research*, *67*(8),

1609–1621.

Howell, K. E., & Annansingh, F. (2013). Knowledge generation and sharing in UK universities: A tale of two cultures? *International Journal of Information Management*, *33*(1), 32–39.

Hoye, K., & Pries, F. (2009). Repeat commercializers: The habitual entrepreneurs of university–industry technology transfer. *Technovation*, *29*(3), 682–689.

Hu, H.-H. (Sunny), Kandampully, J., & Juwaheer, T. D. (2009). Relationships and impacts of service quality, perceived value, customer satisfaction, and image: An empirical study. *The Service Industries Journal*, *29*(2), 111–125.

Hu, M. L., Horng, J. S., & Sun, Y. H. C. (2009). Hospitality teams: Knowledge sharing and service innovation performance. *Tourism Management, 30*(5), 41–50.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal, 20*(4), 195–204.

Hwang, Y., & Kim, D. J. (2007). Understanding affective commitment, collectivist culture, and social influence in relation to knowledge sharing in technology mediated learning. *IEEE Transactions on Professional Communication*, *50*(3), 232–248.

International Monetary Fund (IMF). (2017). Zimbabwe: 2017 Article IV Consultation, Press Release; Staff Report; and Statement by the Executive Director for Zimbabwe, (17), 92.

Isaksen, S. G., & Isaksen, E. J. (2010). The climate for creativity and innovation: And its relationship to empowerment, consumer insight, and ambiguity. *Creativity Research Unit*, *10*(Spring).

Israel, G. D. (1992). Determining sample siz, viewed 03 May 2018 from

https://www.gjimt.ac.in/wp-content/uploads/2017/10/2_Glenn-D.-Israel_Determining-Sample-Size.pdf

Israilidis, J., Siachou, E., Cooke, L., Lock, R., Israilidis, J., Siachou, E., & Lock, R. (2015). Individual variables with an impact on knowledge sharing: The critical role of employees' ignorance. *Journal of Knowledge Management, 19*(6), 1109–1123.

Jahoda, G. (2012). Critical reflections on some recent definitions of 'culture'. *Culture and Psychology*, *18*(3), 289–303.

Jaramillo, A. (2012). Universities through the looking glass: Benchmarking university governance to enable higher education modernization in Middle East North America, World Bank and Center for Mediterranean Integration 173.

Johnson, G., & Scholes, K. (1988). *Exploring corporate strategy text and cases*. Hemel Hempstead: Prentice-Hall.

Jolaee, A., Md Nor, K., Khani, N., & Md Yusoff, R. (2014). Factors affecting knowledge sharing intention among academic staff. *International Journal of Educational Management*, *28*(4), 413–431.

Jung, T., Scott, T., Bower, P., Whalley, D., Mcnally, R., & Mannion, R. (2007). Instruments for the exploration of organisational culture. Working Paper viewed 01 October 2017 from http://www.scothub.org/culture/instruments.html

Kafetzopoulos, D., & Psomas, E. (2015). The impact of innovation capability on the performance of manufacturing companies the Greek case. *Journal of Manufacturing Technology Management*, *26*(1), 104–130.

Kamaşak, R., & Bulutlar, F. (2010). The influence of knowledge sharing on innovation. *European Business Review*, *22*(3), 306–317.

Kariwo, M. T. (2007). Widening access in higher education in Zimbabwe. *Higher Education Policy*, *20*(1), 45–59.

Khazanchi, S., Lewis, M. W., & Boyer, K. K. (2007). Innovation-supportive culture: The impact of organizational values on process innovation. *Journal of Operations Management*, *25*(4), 871–884.

Kianto, A., Vanhala, M., & Heilmann, P. (2016). The impact of knowledge management on job satisfaction. *Journal of Knowledge Management*, *20*(4), 621–636.

Kim, J., Daim, T., & Anderson, T. R. (2009). University technology transfer: A conceptual model of impacting factors and phased process. International Conference on Management of Engineering & Technology. Portland, Oregon, USA – 09/2009.

Kindström, D., Kowalkowski, C., & Sandberg, E. (2013). Enabling service innovation: A dynamic capabilities approach. *Journal of Business Research*, *66*(8), 1063–1073.

Kirby, D. A., Guerrero, M., & Urbano, D. (2011). Making universities more entrepreneurial: Development of a model. *Canadian Journal of Administrative Sciences*, *28*(3), 302–316.

Kligyte, G., & Barrie, S. (2014). Collegiality: Leading us into fantasy – the paradoxical resilience of collegiality in academic leadership. *Higher Education Research & Development*, *33*(1), 157–169.

Klitmøller, A., & Lauring, J. (2013). When global virtual teams share knowledge: Media richness, cultural difference and language commonality. *Journal of World Business*, *48*(3), 398–406.

Kokt, D. (2017). Human resource challenges in the new world of work. *HR Voice*, viewed 06 October 2017 from https://sabpp.co.za/human-resource-challenges-new-world-work-desere-kokt

Kokt, D., & Ramarumo, R. (2015). The impact of organisational culture on job stress and burnout in graded accommodation establishments in the Free State province, South Africa. *International Journal of Contemporary Hospitality Management, 27*(6), 1198–1213.

Kokt, D., & Van der Merwe, C. (2009). Using the competing values framework to investigate organisational culture in a private security company in South Africa. *South African Journal of Economic and Management Sciences, 12*(3), 343–352.

Konrad, N., & Wahl, D. (1990). Science, technology and development indicators for third world countries – possibilities for analysis and grouping. *Scientometrics*, *19*(3-4), 245–270.

Kotecha, P.& Perold, H., (2010). Rebuilding higher education in Zimbabwe: Implications for regional collaboration*. SARUA Leadership Dialogue Series, 2*(1), 1-76.

Kraemer-Mbula, E., & Scerri, M. (2015). Unesco Science Report: Towards 2030. viewed 22 December 2018 from http://uis.unesco.org/sites/default/files/documents/unesco-science-report-towards-2030-part1.pdf

Kruss, G., Mcgrath, S., Petersen, I., & Gastrow, M. (2015). Higher education and economic development: The importance of building technological capabilities. *International Journal of Educational Development*, *43*, 22–31.

Kulkarni, S. (2012). A study on cultural diversity management for Indian organizations. *Procedia – Social and Behavioral Sciences*, *37*, 267–276.

Kuratko, D. F., Covin, J. G., & Hornsby, J. S. (2014). Why implementing corporate innovation is so difficult. *Business Horizons*, *57*(5), 647–655.

Laerd Statistics. (2019). Testing for normality using SPSS Statistics, viewed 20 June 2019 from https://statistics.laerd.com/spss-tutorials/testing-for-normality-using-spss-statistics.php

Landekic, M., Sporcic, M., Martinic, I., & Bakaric, M. (2015). Influence of organizational culture on firm efficiency: Competing values framework in Croatian forestry.

Scandinavian Journal of Forest Research, *30*(7), 624-636.

Langford, P. H. (2009). Measuring organisational climate and employee engagement: Evidence for a 7 Ps model of work practices and outcomes. *Australian Journal of Psychology*, *61*(4), 185–198.

Lemarchand, G. A. (2012). The long-term dynamics of co-authorship scientific networks: Ibero-American countries (1973–2010). *Research Policy*, *4*(1), 291–305.

Li, W. (2010). Virtual knowledge sharing in a cross-cultural context. *Journal of Knowledge Management*, *14*(1), 38–50.

Li, X., Roberts, J., Yan, Y., & Tan, H. (2014). Knowledge sharing in China–UK higher education alliances. *International Business Review*, *23*(2), 343–355.

Lim, K. (2004). The relationship between research and innovation in the semiconductor and pharmaceutical industries (1981–1997). *Research Policy*, *33*(2), 287–321.

Lindquist, E., & Marcy, R. (2016). The competing values framework: Implications for strategic leadership, change and learning in public organizations. *International Journal of Public Leadership*, *12*(2), 167–186.

Mack, L. (2010). The philosophical underpinnings of educational research. *Polyglossia*, *19*(1), 5–11.

MacMillan, J. H., & Schumacher, S. (2010). *Research in education. A conceptual introduction.* Boston, MA: Longman.

Maloney, W. F., & Sarrias, M. (2017). Management quality and innovation. Working Paper, World Bank, Washington, DC.

Mansfield, E. (1991). Academic research and industrial innovation. *Research Policy*,

20(1), 1–12.

Maribel, G., David, U., & Aidin, S. (2015). Entrepreneurial transformation in the Middle East: Experiences from Tehran universities.*Techniques, Technologies Education Management, 10*(4), 533-537.

Markman, A. B. (2018). Creating a culture of innovation, advances in culturally-aware intelligent systems and in cross-cultural psychological studies. *Intelligent Systems Reference Library*, 433–447.

Martínez-Román, J. A., Gamero, J., & Tamayo, J. A. (2011). Analysis of innovation in SMEs using an innovative capability-based non-linear model: A study in the province of Seville (Spain). *Technovation*, *31*(9), 459–475.

McDowell, T., Agarwal, D., Miller, D., Okamoto, T., & Page, T. (2016). Global human capital trends 2016. Deloitte University Press, viewed 06 May 2018 from https://www2.deloitte.com/insights/us/en/focus/human-capital-trends/2016/organizational-models-network-of-teams.html

McMurray, A., & Scott, D. (2013). Determinants of organisational climate for academia. *Higher Education Research and Development*, *32*(6), 960–974.

Meeuwesen, L., Van den Brink-Muinen, A., & Hofstede, G. (2009). Can dimensions of national culture predict cross-national differences in medical communication? *Patient Education and Counseling*, *75*(1), 58–66.

Moonen, P. (2017). The impact of culture on the innovative strength of nations a comprehensive review of the theories of Hofstede, Schwartz, Boisot and Cameron and Quinn. *Journal of Organizational Change Management*, *1*(1), 3–52.

Mullins, L. J. (2010). *Management and organisational behaviour*. Harlow, England: Prentice Hall.

Naor, M., Linderman, K., & Schroeder, R. (2010). The globalization of operations in Eastern and Western countries: Unpacking the relationship between national and

organizational culture and its impact on manufacturing performance. *Journal of Operations Management*, *28*(3), 194–205.

Naranjo-Valencia, J. C., Jimenez-Jimenez, D., & Sanz-Valle, R. (2010). Organizational culture as determinant of product innovation. *European Journal of Innovation Management*, 13(4), 466–480.

Naranjo-Valencia, J. C., Jimenez-Jimenez, D., & Sanz-Valle, R. (2015). Studying the links between organizational culture, innovation, and performance in Spanish companies. *Revista Latinoamericana de Psicologia*, *48*(1), 30–41.

Naranjo-Valencia, J. C., Jimenez-Jimenez, D., & Sanz-Valle, R. (2017). Organizational culture and radical innovation: Does innovative behavior mediate this relationship? *Creativity and Innovation Management*, *26*(4), 407–417.

Navimipour, N.,J., & Charband, Y. (2016). Knowledge sharing mechanisms and techniques in project teams: Literature review, classification, and current trends. *Computers in Human Behavior*, *62*(1), 730–742.

Neelam, N., Bhattacharya, S., Sinha, V., & Tanksale, D. (2015). Organisational culture as a determinant of organisational commitment: What drives IT employees in India, viewed 25 July 2018 from www. wileyonlinelibrary.com

Nelles, J., & Vorley, T. (2011). Entrepreneurial architecture: A blueprint for entrepreneurial universities. *Canadian Journal of Administrative Sciences*, *28*(3), 341–453.

Ngo, H.-Y., & Loi, R. (2008). Human resource flexibility, organizational culture and firm performance: An investigation of multinational firms in Hong Kong. *International Journal of Human Resource Management*, *19*(9), 1654–1666.

Nicholas, W. (2010). *Research methods: The basics*. London and New York: Routledge.

Obeidat, M. R. Y., & Tarhini, A. (2016). A Jordanian empirical study of the associations among transformational leadership, transactional leadership, knowledge sharing, job performance, and firm performance: A structural equation modelling approach. *Journal of Management Development*, *35*(2), 681–705.

OECD (2012). European Commission Report: A guiding framework for entrepreneurial universities, viewed 25 November 2018 from www.oecd.org

Omerzel, D. G., Biloslavo, R., & Trnavcevic, A. (2019). Knowledge management and organisational culture in higher education institutions. *Journal of East European Management Studies*, *16*(2), 111–139.

O'Reilly, C., Chatman, J. A., & Caldwell, D. F. (1991). People and organizational culture – A profile comparison approach to assessing P-O-Fit. *The Academy of Management Journal*, *34*(3), 487–512.

Osunade, O., Ojo, O. M., & Ahisu, E. V. (2009). The role of the internet on the academic performance of students in tertiary institutions. *EDUCI*, *1*, 30–35.

Padilla-Meléndez, A., & Garrido-Moreno, A. (2012). Open innovation in universities: What motivates researchers to engage in knowledge transfer exchanges? *International Journal of Entrepreneurial Behaviour & Research*, *18*(1), 417–439.

Panahi, S., Watson, J., & Partridge, H. (2013). Towards tacit knowledge sharing over social web tools. *Journal of Knowledge Management*, *17*(3), 379–397.

Parker, R., & Bradley, L. (2000). Organisational culture in the public sector organisational culture in the public sector: Evidence from six organisations. *International Journal of Public Sector Management*, *13*(2), 125–141.

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks: Sage Publications.

Pawar, B. S. (2009). Workplace spirituality facilitation: A comprehensive model.

Journal of Business Ethics, *90*(3), 375–386.

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., & Sobrero, M. (2013). Academic engagement and commercialisation: A review of the literature on university-industry relations. *Research Policy*, *42*(2), 423–442.

Petchsawang, P., & Duchon, D. (2009). Measuring workplace spirituality in an Asian context. *Human Resource Development International*, *12*(4), 459–468.

Peters, M. A. (2013). Managerialism and the neoliberal university: Prospects for new forms of ''Open Management'' in higher education, *Contemporary Readings in Law and Social Justice,* 5(1), 11–26.

Peters, T. J., & Waterman, R. H. (1982). In search of excellence: Lessons from America's best-run companies. New York: Warner Books.

Petrakis, P. E., Kostis, P. C., & Valsamis, D. G. (2015). Innovation and competitiveness: Culture as a long-term strategic instrument during the European Great Recession. *Journal of Business Research*, *68*(7), 1436–1438.

Philpott, K., Dooley, L., O'Reilly, C., & Lupton, G. (2011). The entrepreneurial university: Examining the underlying academic tensions. *Technovation*, *31*(4), 161–170.

Pučėtaitė, R., Novelskaitė, A., Lämsä, A. M., & Riivari, E. (2016). The relationship between ethical organisational culture and organisational innovativeness: Comparison of findings from Finland and Lithuania. *Journal of Business Ethics*, *139*(4), 685–700.

Pulakos, E. D., Dorsey, D. W., & Borman, W. C. (2003). Hiring for knowledge-based competition. In S. E. Jackson, M. A. Hitt & A.S. Denisi (Eds.), *Managing knowledge for sustained competitive advantage: Designing strategies for effective human resource management* (pp. 155−176). San Francisco: Jossey-Bass.

Pundziene, A., & Teece, D. J. (2016). New applications of dynamic capability research. *Baltic Journal of Management, 11*(3), 1–5.

Quinn, R. E., & Cameron, K. S. (1983). Organizational life cycles and shifting criteria and effectiveness. *Management Science*, *9*(5), 33–51.

Quinn, R. E., & Kimberly, J. R. (1984). Paradox, planning, and perseverance: Guidelines for managerial practice. In J. R. Kimberly & R. E. Quinn (Eds.), *Managing organizational transitions* (pp. 295–313). Homewood, IL: Dow Jones-Irwin.

Quinn, R. E., & Rohrbaugh, J. (1983). A spatial model of effectiveness criteria: Towards a competing values approach to organizational analysis. *Management Science*, *29*, 363–377.

Quintas, P., Wield, D., & Massey, D. (1992). Academic-industry links and innovation: Questioning the science park model. *Technovation*, *12*(3), 161–175.

Rahimi, R. (2017a). Customer relationship management (people, process and technology) and organisational culture in hotels. *International Journal of Contemporary Hospitality Management*, *29*(5), 1380–1402.

Rahimi, R. (2017b). Organizational culture and customer relationship management: A simple linear regression analysis. *Journal of Hospitality Marketing & Management*, *26*(4), 443–449.

Rahman, M. H., & Moonesar, I. A. (2018). Influence of organizational culture on knowledge transfer: Evidence from the government of Dubai, viewed 22 February 2019 from http://wileyonlinelibrary.com/journal/pa

Ramachandran, S. D., Chong, S. C., & Hishamuddin, I. (2011). Organisational culture: An exploratory study comparing faculties' perspectives within public and private universities in Malaysia. *International Journal of Educational Management, 25*(6), 615–634.

Randhawa, G., & Kaur, K. (2015). An empirical assessment of impact of organizational climate on organizational citizenship behaviour. *Paradigm*, *19*(1), 65–78.

Razak, N. A., Pangil, F., Zin, M. L. M., Yunus, N. A. M., & Asnawi, N. H. (2016). Theories of knowledge sharing behavior in business strategy. *Procedia Economics and Finance*, *37*(16), 545–553.

Razmerita, L., Kirchner, K., & Nielsen, P. (2016). What factors influence knowledge sharing in organizations? A social dilemma perspective of social media communication. *Journal of Knowledge Management*, *20*(6), 1225–1246.

Razmerita, L., Kirchner, K., & Sudzina, F. (2009). Personal knowledge management. *Online Information Review*, *33*(6), 1021–1039.

Rega, S., Naha, N., Mansor, A., & Ramayah, T. (2014). Why organisational culture drives knowledge sharing? *Procedia – Social and Behavioral Sciences*, *129*, 119–126.

Reisinger, Y., & Crotts, J. C. (2010). Applying Hofstede's national culture measures in tourism research: Illuminating issues of divergence and convergence. *Journal of Travel Research*, *49*(2), 153–164.

Republic of Zimbabwe, (2011). Zimbabwe: Medium Term Plan 2011−2015. Ministry of Economic Planning and Economic Promotion: Harare.

Republic of Zimbabwe, (2018). Ministry of Higher & Tertiary Education Database, viewed 25 November 2018 from www.mhtestd.gov.zw.

Reserve Bank of Zimbabwe, (2017). RBZ Quartely Economic Review Report, viewed 24 October 2018 from www.rbz.co.zw/documents/quarterly review/June2017

Rinne, T., Steel, G. D., & Fairweather, J. (2012). Hofstede and Shane revisited: The role of power distance and individualism in national-level innovation success.

Cross-Cultural Research, *46*(2), 91–108.

Robbins, S. P., & Coulter, M. (2013). *Management*. Harlow, England: Pearson Education Limited.

Robbins, S. P., & Judge, T. A. (2013). *Essentials of organisational behaviour*. Harlow, England: Pearson Education Limited.

Rosli, M. M., & Sidek, S. (2013). The impact of innovation on the performance of small and medium manufacturing enterprises: Evidence from Malaysia. *Journal of Innovation Management in Small & Medium Enterprise*, *2013*, 1–16.

Sadikoglu, E., & Zehir, C. (2010). Investigating the effects of innovation and employee performance on the relationship between total quality management practices and firm performance: An empirical study of Turkish firms. *International Journal of Production Economics*, *127*(1), 13–26.

Sadiq S, M., & Daud, S. (2009). Knowledge sharing in higher education institutions. *Vine*, *39*(2), 125–142.

Saenz, J., Aramburu, N., & Rivera, O. (2009). Knowledge sharing and innovation performance: A comparison between high-tech and low-tech companies. *Journal of Intellectual Capital, 10*(1), 22–36.

Sandhu, M., Kishore Jain, K., & Umi Kalthom bte Ahmad, I. (2011). Knowledge sharing among public sector employees: Evidence from Malaysia. *International Journal of Public Sector Management*, *24*(3), 206–226.

Sarooghi, H., Libaers, D., & Burkemper, A. (2015). Examining the relationship between creativity and innovation: A meta-analysis of organizational, cultural, and environmental factors. *Journal of Business Venturing*, *30*(5), 714–731.

SARUA, (2010). Rebuilding Higher Education In Zimbabwe: Implications for Regional Collaboration. *SARUA Leadership Dialogue Series*. 2(1), 1-76.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Research methods for business students. Edinburgh, UK: Pearson Education Limited.

Schein, E. H. (1980). *Organizational psychology*. Englewood Cliffs, NJ: Prentice Hall.

Schein, E. H. (1983). The role of the founder in creating organizational culture. *Organizational Dynamics*, 13–28.

Schein, E. H. (2004). *Organizational culture and leadership* San Francisco: Jossey-Bass.

Schepers, P., & Van den Berg, P. T. (2007). Social factors of work-environment creativity. *Journal of Business and Psychology*, *21*(3), 407–428.

Schmitz, A., Urbano, D., & Dandolini, G. A. (2016). Innovation and entrepreneurship in the academic setting: A systematic literature review. *International Entrepreneurship and Management Journal*, viewed 21 September 2018 from https://link.springer.com

Schwartz, D. G. (2006). Encyclopaedia of knowledge management, viewed 20 October 2017 from http://library.books24x7.com/toc.asp?bookid=14700

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, *5*(9), 9–16.

Sekaran, U., & Bougie, R. (2016). *Research methods for business*. West Sussex, UK: Wiley.

Silva, G. M., Styles, C., & Lages, L. F. (2017). Breakthrough innovation in international business: The impact of tech-innovation and market-innovation on performance. *International Business Review*, *26*(2), 391–404.

Sonnentag, S., & Volmer, J. (2009). Individual-level predictors of task-related teamwork processes: The role of expertise and self-efficacy in team meetings. *Group and Organization Management*, *34*(1), 37–66.

Suppiah, V., & Sandhu, M. S. (2011). Organisational culture's influence on tacit knowledge-sharing behaviour. *Journal of Knowledge Management* ,*15*(3), 462–477.

Sutanto, E. M. (2017). The influence of organizational learning capability and organizational creativity on organizational innovation of universities in East Java, Indonesia. *Asia Pacific Management Review*, viewed 03 August 2019 from www.sciencedirect.com

Swink, M., & Song, M. (2007). Effects of marketing-manufacturing integration on new product development time and competitive advantage. *Journal of Operations Management*, *25*(1), 203–217.

Szyjka, S. (2012). Understanding research paradigms: Trends in science education research. *Problems of Education in the 21st Century*, *43*(110), 110–119.

Tan, C. N. L. (2016). Enhancing knowledge sharing and research collaboration among academics: The role of knowledge management. *Higher Education*, *71*(4), 525–556.

Tangaraja, G., Mohd Rasdi, R., Ismail, M., & Abu Samah, B. (2015). Fostering knowledge sharing behaviour among public sector managers: A proposed model for the Malaysian public service. *Journal of Knowledge Management*, *19*(1), 121–140.

Teece, D., & Pisano, G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change*, *3*(3), 537–556.

Teece, D., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic

management. *Strategic Management Journal*, *18*(7), 509–533.

Teece, D. J. (2012). Dynamic capabilities: Routines versus entrepreneurial action. *Journal of Management Studies*, *49*(8), 1395–1401.

Teece, D. J. (2017). Business models and dynamic capabilities. *Long Range Planning Journal*, 51(1), 40-49.

Teelken, C. (2012). Studies in higher education compliance or pragmatism: How do academics deal with managerialism in higher education? A comparative study in three countries three countries. *Studies in Higher Education,* 37(3), 271–290.

Tellis, G. J., Prabhu, J. C., & Chandy, R. K. (2009). Radical innovation across nations: The preeminence of corporate culture. *Journal of Marketing*, *73*(1), 3–23.

Testa, M. R., & Sipe, L. J. (2013). The organizational culture audit: Countering cultural ambiguity in the service context. *Open Journal of Leadership*, *02*(02), 36–44.

Theriou, N., Maditinos, D., & Theriou, G. (2011). Knowledge management enabler factors and firm performance: An empirical research of the Greek medium and large firms. *European Research Studies Journal*, *14*(2), 97–134.

Theron, L. C., & Liebenberg, L. (2015). Understanding cultural contexts and their relationship to resilience processes. *Youth Resilience and Culture*, *11*(1), 23–37.

Tian, M., Deng, P., Zhang, Y., & Salmador, M. P. (2018). How does culture influence innovation? A systematic literature review. *Management Decision*, viewed 01 May 2019 from www.emeraldinsight.com/0025-1747.htm

Tight, M. (2014). Collegiality and managerialism: A false dichotomy? Evidence from the higher education literature. *Tertiary Education and Management*, *20*(4), 294–306.

Trivellas, P., Akrivouli, Z., Tsifora, E., & Tsoutsa, P. (2015). The impact of knowledge

sharing culture on job satisfaction in accounting firms. The mediating effect of general competencies. *Procedia Economics and Finance*, *19*(15), 238–247.

Trivellas, P., & Dargenidou, D. (2009). Organisational culture, job satisfaction and higher education service quality: The case of Technological Educational Institute of Larissa. *The TQM Journal*, *21*(4), 382–399.

Tsai, Y. (2011). Relationship between organizational culture, leadership behavior and job satisfaction. *BMC Health Services Research*, viewed 01 January 2019 from http://www.biomedcentral.com/1472-6963/11/98

UNESCO. (2014). Mapping research and innovation in the Republic of Zimbabwe: Country profiles in science, technology and innovation policy, vol. 2. Paris: UNESCO.

Urbancová, H. (2012). Results of analysis of organisational culture in organisations in the Czech Republic and Slovak Republic. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *60*(7), 433–440.

Urbano, D., & Guerrero, M. (2013). Entrepreneurial universities: Socioeconomic impacts of academic entrepreneurship in a European region. *Economic Development Quarterly*, *27*(1), 40–55.

Valmohammadi, C., & Roshanzamir, S. (2015). The guidelines of improvement: Relations among organizational culture, TQM and performance. *International Journal of Production Economics*, *164*(1), 167–178.

Van Wijk, C. H., & Finchilescu, G. (2008). Symbols of organisational culture: Describing and prescribing gender integration of navy ships. *Journal of Gender Studies, 17*(3), 237–249.

Visnjic, I., Wiengarten, F., & Neely, A. (2016). Only the brave: Product innovation, service business model innovation, and their impact on performance. *Journal of Product Innovation Management*, *33*(1), 36–52.

Wahyuni, D. (2012). The research design maze: Understanding paradigms, cases, methods and methodologies. *Journal of Applied Management Accounting Research*, *10*(1), 69–80.

Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, *20*(2), 115–131.

Weber, Y., & Yedidia Tarba, S. (2012). Mergers and acquisitions process: The use of corporate culture analysis. *Cross Cultural Management: An International Journal*, *19*(3), 288–303.

Weinberg, A. M., & Graham-Smith, G. (2012). Collegiality: Can it survive the corporate university? *Social Dynamics*, *38*(1), 68–86.

Welman, C., Kruger, F., & Mitchell, B. (2007). *Research methodology*. Cape Town: Oxford University Press.

Widén-Wulff, G. (2009). Organizational culture. *Encyclopedia of Library and Information Sciences,* third edition, 4073–4078.

Witherspoon, C. L., Bergner, J., Cockrell, C., & Stone, D. N. (2013). Antecedents of organizational knowledge sharing: A meta-analysis and critique. *Journal of Knowledge Management*, *17*(2), 250–277.

Ye, F. Y. (2007). A quantitative relationship between per capita GDP and scientometric criteria. *Scientometrics*, *71*(3), 407–413.

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical. *European Journal of Education*, *48*(2), 311–325.

Yin, R. K. (2003). *Case study research: Design and methods*. Thousand Oaks, CA: Sage Publications.

Zammuto, R.F., Gifford, G. and Goodman, E.A. (1999), ``Managerial ideologies, organisation culture and the outcomes of innovation: a competing values perspective'', in Ashkanasy, N., Wilderom, C. and Peterson, M. (Eds), *The Handbook of Organisational Culture and Climate,* Sage, Thousand Oaks, CA

Zareie, B., & ,Navimipour, N.,J (2016). The effect of electronic learning systems on the employee's commitment. *The International Journal of Management Education*, *14*(2), 167–175.

Zhu, C. (2015). Organisational culture and technology-enhanced innovation in higher education. *Pedagogy and Education*, *24*(1), 65–79.

Zikmund, W., Babin, B., Carr, J., & Griffin, M. (2010). *Business research methods.* USA: Cengage Learning.

Zimstat, (2018). Zimbabwe National Statistics Database viewed 01 December 2018 from www.zimstat.co.zw/statistical databases.

Zimstat, (2012). Zimbabwe population census 2012. *Population Census Office*, 1–151.

Zu, X., Robbins, T. L., & Fredendall, L. D. (2010). Mapping the critical links between organizational culture and TQM/Six Sigma practices. *International Journal of Production Economics*, *123*(1), 86–106.

ANNNEXURE A: QUESTIONNAIRE

The completion of the questionnaire is anonymous and your willingness to assist is highly appreciated.

SECTION A – BIOGRAPHICAL INFORMATION

1. Indicate your gender.

1.	Male
2.	Female

2. Indicate the section at GZU in which you are currently employed.

1.	Faculty of Commerce
2.	Faculty of Social Sciences
3.	Faculty of Arts
4.	Faculty of Science
5.	Faculty of Education
6.	Faculty of Law
7	University main administration office

3. Indicate your highest level of qualification

1.	National Certificate
2.	National Diploma
3.	Bachelor's Degree
4.	Master's
5.	PhD

4. Indicate your position at GZU

1.	Junior Lecturer
2.	Senior Lecturer
3.	Associate Professor
4.	Professor
5.	Administrator

5. For how many years have you held your current position at GZU?

1.	Fewer than 5 years
2.	6 to 10 years
3.	11 and above

SECTION B – ORGANISATIONAL CULTURE SECTION

A number of statements are provided. Indicate your level of agreement by circling the appropriate block.

GROUP CULTURE

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
6.1	My supervisor is my mentor/friend.	1	2	3	4	5	6
6.2	I am loyal to GZU.	1	2	3	4	5	6
6.3	GZU values the development of people.	1	2	3	4	5	6
6.4	I can discuss work-related problems with my supervisor.	1	2	3	4	5	6
6.5	I can participate in making suggestions.	1	2	3	4	5	6
6.6	My supervisor cares for my feelings.	1	2	3	4	5	6
6.7	I am committed to GZU.	1	2	3	4	5	6
6.8	I prefer to operate as part of a team.	1	2	3	4	5	6

DEVELOPMENTAL CULTURE

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
6.9	My supervisor makes innovative suggestions to better my performance.	1	2	3	4	5	6
6.10	My supervisor is a risk-taker.	1	2	3	4	5	6
6.11	I am given the opportunity to develop my skills and creativity.	1	2	3	4	5	6
6.12	GZU is a market leader in innovation.	1	2	3	4	5	6
6.13	I am able to make decisions on my own.	1	2	3	4	5	6
6.14	I view GZU as a dynamic organisation that possesses the latest resources.	1	2	3	4	5	6

HIERARCHICAL CULTURE

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
6.15	I know all the rules and regulations I am supposed to follow.	1	2	3	4	5	6
6.16	I always follow the rules and regulations.	1	2	3	4	5	6
6.17	My supervisor prefers to make all the decisions on procedures to follow.	1	2	3	4	5	6
6.18	Every action is coordinated for the smooth running of the organisation.	1	2	3	4	5	6
6.19	Everything must always be done according to plan.	1	2	3	4	5	6

RATIONAL CULTURE

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
6.20	My supervisor is focused on the task to be accomplished.	1	2	3	4	5	6
6.21	I know what is expected of me with regard to my tasks.	1	2	3	4	5	6
6.22	My supervisor sets clear goals.	1	2	3	4	5	6
6.23	GZU is service and results oriented.	1	2	3	4	5	6
6.24	I always strive to render the best possible service to students / other employees / suppliers.	1	2	3	4	5	6

SECTION C – INNOVATION SECTION

A number of statements are provided. Indicate your level of agreement by circling the appropriate block.

EMPLOYEE CREATIVITY AND EMPOWERMENT

		Strongly disagree	Disagree	Strongly disagree	Slightly agree	Agree	Strongly agree
7.1	I consider myself to be a creative/innovative person.	1	2	3	4	5	6
7.2	Innovation at GZU is more likely to succeed if employees are allowed to be unique.	1	2	3	4	5	6
7.3	GZU uses my creativity to its benefit.	1	2	3	4	5	6
7.4	I am given the opportunity to develop my creative potential.	1	2	3	4	5	6

ORGANISATIONAL CONSTITUENCY

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
7.5	I am connected to an innovation movement at GZU.	1	2	3	4	5	6
7.6	There is trust and mutual respect between GZU management and employees.	1	2	3	4	5	6
7.7	The employees in my area act as a team.	1	2	3	4	5	6
7.8	At GZU communication is open and honest.	1	2	3	4	5	6
7.9	GZU has an effective environment for collaboration within and between departments.	1	2	3	4	5	6

ORGANISATIONAL LEARNING

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
7.10	There is innovation mentorship at GZU.	1	2	3	4	5	6
7.11	GZU management possesses the appropriate leadership qualities to support innovation.	1	2	3	4	5	6
7.12	Everyone in our organisation is involved in learning (training) to be innovative.	1	2	3	4	5	6
7.13	I know the training/ learning needs I have to engage myself in to support innovation.	1	2	3	4	5	6

INNOVATION PROPENSITY

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
7.14	Innovation is an underlying culture and not just a word at GZU.	1	2	3	4	5	6
7.15	The GZU operating model is premised on innovation strategic intent.	1	2	3	4	5	6
7.16	At GZU there is a coherent set of innovation goals and objectives that have been well articulated.	1	2	3	4	5	6
7.16	At GZU employees meet and discuss ideas about innovation.	1	2	3	4	5	6

IMPLEMENTATION CONTEXT

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
7.17	GZU has a wide resources base as it relates to innovation.	1	2	3	4	5	6
7.18	GZU has a good record of rolling out innovations.	1	2	3	4	5	6
7.19	Ideas at GZU flow smoothly through to commercialisation.	1	2	3	4	5	6
7.20	GZU management helps break down barriers that stand in the way of innovation implementation.	1	2	3	4	5	6
7.21	GZU has metrics to measure the effectiveness of its innovation initiatives.	1	2	3	4	5	6

SECTION D – KNOWLEDGE SHARING SECTION

A number of statements are provided. Indicate your level of agreement by circling the appropriate block.

SUBJECTIVE NORMS

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
8.1	People who influence my behaviour (colleagues, friends, family, etc.) think that I should share my knowledge.	1	2	3	4	5	6
8.2	I respect and put into practice the decisions from my colleagues, friends and family regarding knowledge sharing.	1	2	3	4	5	6

SELF-EFFICACY

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
8.3	Sharing my knowledge would help other members at GZU to solve problems.	1	2	3	4	5	6
8.4	Sharing my knowledge would create new opportunities for GZU.	1	2	3	4	5	6
8.5	Sharing my knowledge would improve work processes at GZU.	1	2	3	4	5	6
8.6	My knowledge sharing would help GZU achieve its goals.	1	2	3	4	5	6

ORGANISATIONAL SUPPORT

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
8.7	GZU has appropriate technology in place (e.g. academic portal, web site, e-mail) to support knowledge sharing.	1	2	3	4	5	6
8.8	GZU has processes in place (e.g. meeting, colloquium, intellectual discourse session) for knowledge sharing.	1	2	3	4	5	6
8.9	GZU supports the formation of networks (e.g. community of practice) where knowledge sharing can take place.	1	2	3	4	5	6

ATTITUDE TOWARDS KNOWLEDGE SHARING

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
8.10	I like sharing knowledge with other GZU members.	1	2	3	4	5	6
8.11	Sharing my knowledge with other GZU members adds value to me.	1	2	3	4	5	6
8.12	Sharing my knowledge with other GZU members is a wise move.	1	2	3	4	5	6

INTENTION TO SHARE KNOWLEDGE

		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
7.13	I intend sharing my knowledge with other GZU members more frequently.	1	2	3	4	5	6
7.14	I will share my knowledge with anyone at GZU if it is applicable to work matters.	1	2	3	4	5	6

THANK YOU FOR YOUR COOPERATION!